VOL. XLIII
No. 3.

JUNE, 1913.

Foreign, $3.60.
Canada, $3.25.
Single Copies, 30 Cents in U. S.

AMERICAN
VETERINARY REVIEW

EDITED BY

Prof. A. LIAUTARD, M.D., V.M.,

Member Central Society of Veterinary Medicine (Paris). Honorary Fellow Royal College Veterinary Surgeons (England). Foreign Corresponding Member Academy of Medicine, Bruxelles (Belgique).

AND

Prof. ROBERT W. ELLIS, D.V.S.

WITH THE COLLABORATION OF

Prof. W. J. COATES, M.D., D.V.S., New York-American Veterinary College.
OLAF SCHWARZKOPF, Veterinarian, 3d Cavalry, U. S. Army, Fort Sam Houston, Texas.
Prof. W. L. WILLIAMS, V.S., New York State Veterinary College, Ithaca, N. Y.
Prof. S. STEWART, Kansas City Veterinary College, Kansas City, Mo.
M. H. MCKILLIP, M.D., V.S., McKillip Veterinary College, Chicago, Ill.
B. F. KAUPP, M.S., D.V.S., Research Pathologist, Chicago, Ill.
Prof. M. H. REYNOLDS, University of Minnesota, St. Anthony Park, Minn.
WM. H. DALRYMPLE, M.R.C.V.S., Veterinarian Louisiana Ag. Exp. Sta., Baton Rouge, La.
JOHN P. O'LEARY, V.M.D., Veterinary Inspector in Charge, B. A. I., Troy, N. Y.
A. T. KINSLEY, M.Sc., D.V.S., Path. Kansas City, Veterinary College Kansas City, Mo.
Prof. S. SISSON, S.B., V.S., Prof. Comp. Anat., Ohio State University, author of Sisson's Vet. Anat., etc., Columbus, O.
J. G. RUTHERFORD, V.S., H.A.R.C.V.S., Ex-Veterinary Director-General and Live Stock Commissioner, Ottawa, Canada.
J. F. DE VINE, D.V.S., Dept. Agr., Goshen, N.Y.
D. ARTHUR HUGHES, PH.D., D.V.M., Insp. Comm. Dept., U. S. Army, Chicago, Ill.
JOHN R. MOHLER, V.M.D., Pres. American Veterinary Medical Association, Washington, D. C.
L. A. MERILLAT, V. S., Chicago Veterinary College, Chicago, Ill.
D. E. SALMON, D.V.M., Ex-Director of the Veterinary School, Montevideo, Uruguay.
Prof. VERANUS A. MOORE, Director, New York State Veterinary College, Ithaca, N. Y.
RICHARD P. LYMAN, Dean Vet. Div. Mich. Agr. College, East Lansing, Mich.
C. J. MARSHALL, V.M.D., Sec'y A. V. M. A., Philadelphia, Pa.
A. D. MELVIN, M.D.C., Chief of B. A. I., Washington, D. C.
GEO. H. GLOVER, M.S., D.V.M., Director Div. Vet. Sci., Colo. Agr. Coll., Ft. Collins, Colo.
S. A. GRUENER, M.V.S., Veterinary Inspector, Kamchatka, Russia.

And several others.

CONTENTS.

The AMERICAN VETERINARY REVIEW is issued on the 1st of each month. *Manuscript and copy for insertion should be received by the 12th of the preceding month* to insure insertion in the next month's number. *Volume commences* April and October.

Communications relating to publication, subscriptions, advertisements and remittances should be addressed to
AMERICAN VETERINARY REVIEW, 509 West 152d Street, New York, N. Y.

European Exchanges, books for review and personal letters should be addressed to
A. LIAUTARD, M.D., V.M., 14 Avenue de l'Opera, Paris, France

Entered at the Post Office at New York as Second-Class Matter
Oldest and Most Widely Circulated Veterinary Periodical in America

AMERICAN VETERINARY REVIEW.

JUNE, 1913.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, April 15, 1913.

CELL INCLUSIONS AND FILTERING VIRUS.—In the *Reveue Generale,* some months ago, Dr. E. Cesari has made a thorough study of this subject, from which I am sure an extract would prove interesting.

There remains yet to-day a large class of infectious diseases, with virus still unknown, at least as far as their figurative aspect. Without going out of veterinary pathology, there may be mentioned relating to this, foot and mouth disease, smallpox of sheep, rabies, distemper of dogs, vaccinia, contagious epithelioma of birds, aviary pest, etc.

We know that these viruses are constituted by corpuscular living bodies, liable to affect forms smaller than the smallest visible microbes, as it is demonstrated by the power that they possess of passing through the filtering walls which retain those. It then seems legitimate to admit that these micro-organisms do escape our visual examination, only because of insufficiency of our magnifying optic means or because of the imperfection of the means of coloration which we use.

However, it appears that in most of the diseases with filtering virus, there exist in the interior of the cells, touched by the

pathologic processes, peculiar formations, foreign to the normal anatomic constitution of those cells; formations which, besides, cannot be considered as related to any known type of parasites. Those figurative elements, whose origin, nature and function are yet very much discussed, appear in the cellular protoplasm, sometimes even in the nucleus, under excessively varying forms and dimensions. And for a long time a new theory has been founded by which those enigmatic elements, differently known as *cellular formations* or *inclusions, intracellular bodies or corpuscles,* are considered as the specific parasitic agents of the diseases where they are found.

After giving the history of the discovery of those inclusions, Mr. Cesari reviews the various formations which have been described for the diseases with filtering virus among animals, viz.: the contagious epithelioma of birds, vaccine variola, rabies, etc., etc.

Do the inclusions represent the specific parasitic agents of filtering virus diseases, or must they be considered as elements of cellular origin?

* * *

The advocates of the parasitic theory acknowledge that the formations that they promote to the rank of parasites do not resemble any type of known parasite. They can classify them among the protozoa group, which by its undefined characters and unbounded limits is used as a refuge for all similar elements of parasitology.

The hypothesis of the protozoa nature of inclusions rests principally upon the existence of nuclear elements and the various figures that represent those inclusions; figures which may, with mind allowance, be considered as the successive stages in the developing variations of the parasites. However, the existence of nuclear elements, belonging properly to inclusions, is denied by the advocates of the opposite theory, which contest the filiation of the various aspects referred to as belonging to the evolu-

tive cycle of the parasite, on account of the absence of the forms of union.

The faculty to throw out pseudopods and execute amiboid movements would be a powerful point in favor of the protozoa nature of the inclusions, if that faculty was well established. But this power has been mentioned only for the Guardinieri's bodies (inclusions of vaccinia) and it has been denied by more recent observations.

Direct proof missing, other arguments were presented to support the parasitic theory of inclusions, which were drawn from the constant and specific condition of those inclusions and also from their repetition in the cells interested in the pathological processes.

The constant presence of the inclusions is the rule, but it is not absolute. In rabies, the authors that advocate the parasitic theory acknowledge that they are missing between 1 to 10 per cent. In rabies with fixed virus, inclusions are often not discovered. In dog distemper Sinigaglia acknowledges that intracellular bodies are sometimes absent.

The specificity of the inclusions is also a poor argument. It might be as easy to say, in an opposite supposition, that the specificity remains in the peculiar mode of cellular reaction produced by the virus considered. But even absolute specificity is doubted; Sikorsky inoculating the diphtheric toxine or heated vaccine, on the cornea of a rabbit, says he has obtained figures identical to the bodies of Guardinieri.

The localization of inclusions in the cells does not exactly follow the repetition of the virus. If the tissues which contain infusions are always virulents and if, at the time of putrefaction, the virulency remains as long as the inclusions do persist, the reciprocal is not always found. In rabies the virulency of the nervous centers is present before the apparition of Negri's bodies. And besides, these inclusions are missing in some virulent organs, as the salivary glands and the peripheric nerves.

* * *

However, Sinigaglia has mentioned in dog distemper a close relation between the distribution of the inclusions and the clinical type affected by the disease. This author considers as an important argument in the favor of the parasitic theory the fact that the specific inclusions are found with the same structure and the same histo-chemical reactions, in the cells of the bronchial epithelium with the broncho-pulmonary localizations of the disease and in the cells of the cerebro-spinal axis when the disease develops under the nervous form. It is, indeed, difficult to suppose, if the inclusions are considered as phenomena of cellular reaction, that cells as unlike as the nervous and the epithelial of the bronchia could give rise to identical formations.

The authors who do not admit the parasitic nature of inclusions grant them a cellular origin. Some, with Metchnikoff and Salmon, have thought that there was possibly a transformation of the leucocytar elements which had penetrated the interior of the epithelial cells. To-day, all are agreed in admitting that inclusions derive from the nuclei of cells and represent the homologies of the chromidal formations. But this interpretation has not been sufficiently proved to convince the advocates of the parasitic theory.

The principal argument against the doctrine of the protozoa inclusions is that of the filtrability of the viruses; that those so-called parasites are supposed to represent. If some protozoa are known, some water vibrios, as able to pass through filtering bougies, although their dimensions do not permit them to be seen with the microscope, it cannot, however, be admitted that immobile elements as large as the bodies of Guarineri and of Negri can pass through filters as close as those of Kitasato or of Maassen, which are yet permeable to the virus of vaccinia and rabies.

To make the parasitic theory agree with the notion of filtrability, it must then be supposed that, with the visible protozoa inclusions, there exist other forms; smaller forms of reproduction, young forms which are invisible and filtrable. The existence of such has been proved for few trypanosomes and some spirochetes.

The same arguments and objections can be advanced in relation to the theory of Prowazek. The unknown solution remains the same.

In other words and to conclude, it seems evident that the primitive conception of the filtering virus remains about the same, and that the definitive proof of the parasitic action of the inclusions shall be proved only when they shall have been cultivated *in vitro* and that, with the cultures, the disease shall be reproduced. For pleuro-pneumonia of bovines the question has already been solved, and it can be hoped that this important problem of the inclusions shall soon be solved as it is also that of the cultures of filtering viruses.

* * *

NEGRI CORPUSCLES AND SPECIFIC RABID FORMATIONS.—In the *Annales de l'Institute Pasteur* there was published recently a communication of these subjects by Dr. Manouelia, which was resumed in the *Presse Medicale* as follows:

The corpuscles discovered by Negri in 1903 in the nervous centers of animals suffering with street rabies are now recognized by all specialists as characteristic. The presence of these corpuscles allows a rapid diagnosis of rabies at the post mortem of a suspected animal.

In the study made by Manouelia, he first gives the minute details which permit the sure discovery of these elements when they exist. Colored by appropriate methods, the corpuscles of Negri are most often found in the cytoplasma and in the large dendretic prolongations of the nervous cells. Their dimensions vary very much. They are surrounded by a hyaline membrane and have a granular structure.

It may be said that, in declared street rabies, Negri's corpuscles exist in a constant manner. Out of 110 cases studied by Manouelia and controlled by experimental tests, the histological examination has revealed the presence of the corpuscles in 106 cases. In 91 cases, where experimental test excluded the diagnosis of rabies, 82 gave a negative answer to the research of the

Negri's bodies. For nine cases, where there were results at variance in the two methods, it is justifiable to admit, however, that the cases were certainly rabid. If indeed the experimental method failed, it may have been due to the fact that the inoculation had been made in muscles and not in the brain, or again because the animals of experiments were not kept in observation for a sufficient length of time.

From this very important statistic the almost absolute value of the histological examination for the Negri's bodies is readily brought out. And this examination has an enormous superiority for establishing a diagnosis in a few hours. It is therefore an essentially practical method.

With rabies of fixed virus, Negri's bodies do not, properly speaking, exist. A fact well established by the first researches of Manouelia. However, in examining the nervous centers of animals arrived at the last period of the disease, there were found, principally in the horns of Ammon and the cerebral cortical layer, very numerous small corpuscles, having the same affinities as the Negri's bodies and situated in the protoplasm of the cells. These formations, which are all the time absent in control animals, are found already, but in small quantity, at the onset, and become numerous in the course of the disease.

The signification of Negri's bodies has been the subject of much discussion, and the present tendency is to refuse them the quality of parasites that Negri gave them. To arrive at an opinion on the subject, Manouelia has studied with the same coloring methods the residual elements of testicle, which are constituted by the part of the cytoplasm which, in the transformation of the spermatids into spermatozoids, is to disappear. These cell remains have exactly, or nearly so, the same affinities, the same coloring reactions, the same morphological peculiarities as the corpuscles of Negri. There is, therefore, in this an argument of analogy in favor of the non-parasitar nature of Negri's bodies, which then would be formations of cell origin, without taking from them any of their value in the diagnosis and their practical application.

* * *

FLOATING KIDNEY.—This ectopia of the kidney, also denominated as moving kidney or paphroptosis, is much more frequent in human species, where it is specially the organ of the right side which is affected. The anatomic conformation, which is the cause of it, does not exist in animals, and perhaps it is to this that veterinary literature is so poor in relation to the affection, as it occurs less frequently.

The kidneys have means of attachment, which, either by main force, traumatism or any other violent cause, or again by slow, progressive relaxation, may permit the displacement of the organ and give rise to two species of acquired ectopias, that by traumas and that by weakness of the means of support. The former also called renal dislocations is said to be comparatively rare in human, but may occur more frequently in animals, as is illustrated by the case that Prof. Hebrant and Antoine of the Cureghen School recorded in the *Annales de Bruxelles.*

The case is probably the only one in record and deserves attention. Its history is suggestive. The head of a pack of hounds, a slut of superior qualities, very active and ambitious, has lately become lazy in its runs and grown taking fat. She is not in pup, but she grows worse as the time of delivery is passed off. She keeps getting fat, can run no more and yet continues to be in apparent perfect health.

When seen by the professors, she is rather in very good condition. By mammal exploration of the abdomen, a tumor elongated, shape of kidney, slightly painful to pressure, was detected floating amongst the intestinal circumvolutions. The tumor is smooth and not bosselated, free from adherences with the visceras. It is held suspended to the lumbar region by a peduncle.

Not having met before with a floating kidney in dog, a positive diagnosis was not made, although the characters of this abdominal growth and those of a true kidney were almost sufficient to justify it.

To remove all doubts, explorative laparotomy was suggested. The question was settled. It was the left kidney which was hanging among the intestines, held by its means of attachment very largely elongated.

The curative treatment of renal ectopia in human medicine consists in nephrectomy or nephrorrhaphy. Neither of which could be of any great results in the present case. The former, serious operation, which was not justified, as the kidney was neither diseased nor degenerated. The second, as it did not present a sufficient possibility of usefulness of the animal afterwards, the relaxation being likely to return. The animal was destroyed.

This case of the Belgian professors is one which other practitioners will be interested in, as similar ones may be observed and valuable additions to the literature of canine pathology be obtained.

* * *

A GLANCE IN COMPARATIVE PATHOLOGY.—It is very surprising what progress comparative pathology has made in later years and how more and more frequently records are found on subjects relating to it. It is therefore not surprising to see veterinarians occupying themselves in that direction and their pathologists drawing the attention of the scientific world to the value of their work and of its usefulness. In the French Association for the *Study of Cancer,* veterinarians are attentive, attending members, and one of them seldom miss a meeting without producing some cases illustrating the comparative frequency of cancer in our domestic animals. At some recent meeting, Prof. G. Petit, of Alfort, has presented a number of specimens and related the history of a number of cases of great interest. It was first one of PRIMITIVE GENERALIZED EPITHELIOMA OF THE LIVER in sheep. The organ was the seat of a large tumor, whitish, which invaded almost its entirety and formed but one large mass. The mesentery was covered with a large number of small nodules, elevated, varying between the size of the head of a pin and that of a pea. The mediastinal lymphatic glands were also hypertrophied and diseased all through.

Cancer seems to be exceptional in sheep, but as it is an animal

killed when young, it is probable that more diseased ones could be found if they were kept until an advanced age, as in fact is seen in horses and cattle.

At the same meeting, Prof. Petit presented and reported his observations upon five cases of *Dentritic epithelioma of the mammæ in domestic carnivorous.* One was in a female cat aged 12 years, which during nearly one year presented a tumour of the mammæ, spreading flat, ulcerated and bleeding. At death, the axillary glands were found diseased.

The second case was observed in a 9 years old slut. The tumour had for origin the epithelium of the galactophorous canals, it presented intercanalicular vegetations which explained the hemorrhages during life.

The third case was in an old slut. She had a tumour that weighed several kilograms. On a macroscopic section it showed besides, a great collection of whitish masses formed of confluent neoplasic elements and of hemorrhagic cysts.

The fourth case was in a cat whose tumour presented metatasis in the tracheo-bronchial glands, the lungs, the small intestines.

In the fifth case the metastasis were still more distributed. The lymphatics of the mediastinum, the lungs and the liver being involved and also a large neoplasic mass of unusual dimensions.

* * *

PROCEEDINGS OF THE A.V.M. ASS'N.—I do not know if my friends in America or the readers of the REVIEW will ever appreciate the pleasant feelings that one, far from them, has when something reaches him, bringing to him the history of the life for a week of his professional friends.

That feeling has been my great joy for years when the annual visit has come under the shape of the Proceedings of the Am. Vet. Med. Ass'n. now from one place and then from another. This year they relate the doings of the forty-ninth meeting held in Indianapolis.

May you call for some time yet, my welcome friend, you will always find me glad and happy at the news that you bring, of the good work that you announce, of the progress that our profession is making and of the many new fellow-veterinarians, whose faces I have the pleasure to see, thanks to the kind attention of our Chairman of the Publication Committee, Dr. R. P. Lyman.

The book that I have received, the *Proceedings of the forty-ninth Meeting of the Association,* is very much like its predecessors. General disposition, similar distribution and make-up, addresses, report of committees and resident secretaries, papers and discussions, clinic, social features, etc. All of that is contained in a book of a little smaller size than that of last year, not from lack of material, but, it has seemed to me, because the papers were more condensed than has been customary in previous meetings. But nevertheless the articles are unusually interesting and have called forth much discussion. It would be very difficult to make a special reference to any of the papers that were read as most must already be known and besides each one has its own value according to the specific object of the reader. There is no doubt that the papers of Dr. Berns on Radial Paralysis, of Dr. Cochrane on Stifle Lameness, of Dr. Williams on Sterility—and of many others among the crowd will call repeated attention. As I cannot select one from the other, I will advise my friends to read them all. The Proceedings are printed, a call to Dr. Lyman will receive attention. Dr. Williams in his next report as librarian will not be able to show again an increase in the number of volumes left on his hands, and everybody will have enjoyed and learned much by the reading of the proceedings—I for one!!

* * *

Bibliographic Items.—*Agricultural Journal of South Africa* for February, 1913—with articles on "Tuberculosis of food animals and its relation to the public health," by Walter Jowett F.R.C.V.S. on "Dips and Dipping," by Dr. A. Theiler

and Principal C. F. Gray: also a schedule of infectious and contagious diseases by the same.

Quarterly Bulletin, Chicago Veterinary College, Number 2, December, 1912.

Second Fasicules of Volume I of the Proceedings of the first *International Congress of Comparative Pathology* containing communications on the comparative study of Cirrhosis, of cancer; on parasites common to man and animals; on Variola and Vaccinia; on Rabies; on Vegetal pathology; on the pathology of inferior animals.

Three Interesting Cryptorchid Cases, by Prof. Hobday. Reprint from the *Veterin. Journal.* A. L.

WILL THEY BE HONEST WITH US?

The Army and Navy Journal of May 3d announces that Representative Hay of Virginia has introduced a bill aiming to consolidate the Veterinary Service, U. S. Army, and increase its efficiency. In the main it is the same as the original bill, of the same title, introduced into the Lower House, January, 1912. It is known as House bill 4541.

This has much significance. Mr. Hay, who is the chairman of the House Committee on Military Affairs, and far and away the most influential man in military affairs amongst the Democrats in that body, now fathers the bill which he so admirably championed and defended when it passed the House, during the 62d congress, unanimously. The Senate Military Committee is Democratic in majority, and therefore expected to be harmonious with Mr. Hay's Committee in the House of Representatives. That is the rock upon which the army veterinary service bill was shipwrecked in the last Congress. The Senate Military Committee had a political majority opposite in faith to that of the Lower House. The powers that be in the War Department nudged the Secretary of War, who was of the same political stripe as the majority in the Senate Military Committee. The Secretary nudged the knowing ones in the Senate Military Committee, and the bill was stalled.

Will the powers that be in the War Department be honest with the veterinary profession in this Congress? That is the question. Will they dare to do otherwise; or will they use the same adroitness and craft to stop the course of justice, as they have hitherto done? That, men of the veterinary profession of America, depends upon you. The people's representatives will do the people's will. We have convinced Mr. Hay that our claim, that we should be recognized as a profession in the army, is just. Can we bring the same conviction into the minds of Senator Johnston of Alabama, chairman of the Senate Military Committee, and the Secretary of War, Mr. Garrison, and so offset the snares that may be sown by certain ones in the War Department? We will be honest with them if they will be honest with us. Machiavellism and duplicity cannot alway stay the course of justice. G. S.

STATE VETERINARY COLLEGE AT NEW YORK UNIVERSITY IN NEW YORK CITY.—*The New York Times,* of Sunday, May 25, announced that Governor Sulzer had signed a bill establishing a State Veterinary College at New York University in New York City. This means the perpetuity of the New York-American Veterinary College by the state, and will be pleasant news to the alumni of the two old institutions, through the consolidation of which the present school was formed; namely, the New York College of Veterinary Surgeons (1857) and the American Veterinary College (1875).

A SYSTEM OF VETERINARY MEDICINE; EDITED BY E. WALLACE HOARE.—We have recently received from Mr. Alexander Eger, Chicago, volume I of *A System of Veterinary Medicine,* bound in half-leather and containing 1,327 pages of text. We could not do justice to this book, which has the writings of no less than thirty-three collaborators within its covers, this month, for lack of time; but will review it in our July issue.

THE MONTANA STATE BOARD OF EXAMINERS IN VETERINARY MEDICINE AND SURGERY as appointed by Governor Stewart are: W. C. Orr, V.S., Dillon, Mont., President; W. J. Taylor, D.V.M., Bozeman, Mont., Vice-President; A. D. Knowles, D.V.M., Livingston, Mont., Secretary-Treasurer.

ORIGINAL ARTICLES.

THE CONJUNCTIVAL REACTION FOR GLANDERS.*

(OPHTHALMIC TEST.)

By K. F. Meyer, Philadelphia, Pa.
(From the Laboratory of the Pennsylvania State Livestock Sanitary Board.)

During the last four years, in different parts of the world, extensive experiments have been conducted to find an accurate method by which glanders in horses can be quickly diagnosed by the practitioner without awaiting the result of one of the reliable serum tests. It has been found by Vallée (1), Martell (2), de Blieck (3), Schnürer (4), Müller, Gæhtgens and Aoki (5), Fröhner (6), Reinhardt (7), Miessner (8), and others that the local allergic reactions may be successfully used for this purpose, and that they undoubtedly offer great advantages and greater reliability than any of the other mallein tests. By reason of the fact that mallein, compared with tuberculin, gives a more pronounced local reaction when subcutaneously applied, theoretically, better results are expected in glanders with the local tests than in tuberculosis by similar methods. The investigations of Schnürer on more than 10,000 army horses were so encouraging that it was considered advisable to experiment along similar lines in Pennsylvania.

From preliminary experiments with mallein brûte of the Institut Pasteur, and with our own preparations of similar composition, it was concluded that only a specially prepared standard mallein would promise uniformly satisfactory results. The

* Reprinted from *The Journal of Infectious Diseases*, Vol. XII, No. 2, March, 1913, pp. 170-190.

assertion of Wladimiroff (9) that the use of an unknown, untested preparation will never permit comparative deductions, is only too true, and can without reserve be applied to many of the mallein products of commercial houses. All the ordinary "raw" mallein preparations are poor in the specific antigens and, particularly in occult cases of glanders, cause extremely weak and indistinct reactions. As none of the tested mallein preparations ("Mallein siccum Foth"; mallein of the "chemische Fabrik Humann und Teisler," etc.) used in Europe for the conjunctival tests were on the market in America, an attempt was made to prepare such a biologic product in our own laboratory. After several unsuccessful attempts, largely due to unsuitable glanders cultures, a mallein was obtained which gave unquestionably perfect results. The mallein used for this purpose is known under the name of "Mallein siccum Foth." Its preparation is given here, as it is of essential importance for the conjunctival test.

Preparation of "Mallein Siccum."

According to the outline given by Foth (10), which practically has been followed in our laboratory, the preparation is as follows:

Slightly acid 2 per cent. peptone and 4.5 per cent. glycerin broth in wide Pasteur flasks (in the quantity of 250 c.c.) is inoculated with highly virulent glanders bacilli. The broth consists of equal parts of meat and potato extract. The glanders strain, selected for this purpose from a series of 20 strains from different outbreaks, has been passed through cats and tends to grow remarkably well on the surface of the broth. This feature is particularly important for the production of a potent mallein. For four to six weeks the cultures remain in the incubator at a temperature of 38° C. After being tested for purity and killed by heating to 70°-100° C., the fluid is concentrated slowly to 1/10 of its original volume in a vacuum distilling apparatus at a temperature of 75°-80° C. The syrup-like, brownish fluid is sucked through a number of folded filters. The process fre-

quently is extremely slow, and the loss due to the filtration is comparatively high. The clear fluid is then precipitated in absolute alcohol (1 part of mallein to 30 parts of absolute alcohol). The pouring of the fluid into the alcohol should be done carefully, as otherwise a coarse, sticky deposit will result instead of a fine, flocculent, white-brownish one. The precipitation should be done only with absolutely water-free alcohol. The precipitate is filtered off, washed with absolute alcohol or ether, and spread on dry clay plates which are afterward put into an exsiccator and, under vacuum, dried over sulfuric acid. After 24 hours, a light, whitish powder can be scraped from the clay plates; this powder dissolves very readily in water, which it tinges a dark brown. A carefuly prepared powder should not be hygroscopic, and, if protected from light (one of the main characteristics of mallein toxin is that it is very labile to light), will be active for one entire year and, according to the experience of others, probably longer. According to Foth, an old powder is more elective in its antigen properties than a fresh preparation, because the unspecific pyrogenous substances disintegrate more quickly than the specific mallein substances which in powder form remain practically unaltered.

Technic of the Reaction.

Preliminary experiments have shown that the solution of the powder disintegrates rapidly, which is due in part to the absence of preservatives and in part to changes in toxin molecules. Therefore the powder form alone can be kept in stock, and the test solution should always be made shortly before use. It was found that the best and handiest equipment for the practicing veterinarian consists of two small bottles, one containing the powder, the other, sterile or saline water in such quantity as will make a 5 per cent. solution of mallein. Bottles are kept in stock with the quantities which are necessary to test 10 or 50 horses respectively. It is considered that the quantity of 0.1 c.c. solution (according to the calculations made by Schnürer) is quite sufficient to test one horse. As explained, such pre-

pared mallein deteriorates rapidly. Therefore the solution should be used immediately after its preparation and the remainder should be discarded. Recently, with a very strong mallein, weaker solutions of the powder (1 per cent. and 2 per cent.) have been tested and found to be as satisfactory as when a 5 per cent. solution is used.

Application of the Mallein.

The solution of mallein is instilled by means of an eye-dropper in the quantity of two to three drops; it is not necessary to work absolutely quantitatively. During the last few months, in several glanders outbreaks, the mallein has been applied to the conjunctival sac by means of a camel-hair brush, with which, naturally, quantitative working is impossible. The eye should not be handled after the instillation has been made. A successful quantitative working is impossible because the animal usually closes its eyes after successful instillation, and a certain amount of the instilled mallein is expressed with the tears. The objection that the use of a camel-hair brush may act as an agent in the distribution of glanders has been disproved by experiments of Galtier and Schnürer. Instead of the eye-dropper or brush, Müller, Gaehtgens, and Aoki have recommended the use of a glass rod. The camel-hair brush, which can be kept clean in carbolic acid when not in use, has the disadvantage of diluting the mallein solution with the conjunctivaly secretion. On the other hand, the application with the eye-dropper is, under ordinary circumstances, an extremely tedious task, particularly when testing young and nervous animals and when the light conditions in the stable are unfavorable. Special recommendations cannot be made and it is best to individualize according to the conditions. In any case, a careful examination of the eye in good light should be made before the mallein is applied. In one instance, a misleading result, similar to those discussed by Schnürer, was obtained in our experiments, largely due to the fact that an incipient conjunctivitis caused by a foreign body was overlooked at the time of inspection.

Schnürer frequently found an increase in temperature during the reaction and therefore advises the taking of temperatures in a manner that will be explained later. Miessner considers this rise unnecessary for a diagnosis and its detection too laborious for the benefit which can be derived from a temperature increase which is frequently only slight. Based on our own observations, the view of Miessner can, without restriction, be supported. Only in four outbreaks previous to the application of the mallein, the temperatures were taken with "Reform" thermometers. I agree with Miessner that the temperature fluctuations are, in 98 per cent. of the cases, so small that they can be recorded only when working with the greatest possible accuracy. Under the usual conditions, the results and their application for the diagnosis are, therefore, illusive and of no practical value.

Reactions.

In the majority of cases, shortly after the application of the mallein, slight lacrimation and perhaps an inferior degree of photophobia will be observed. For a few hours this reaction is absolutely non-specific and has nothing whatever to do with the specific reaction, which usually occurs five to seven hours after the application of the test. According to Schnürer, Fedders, and others, the specific reaction does not begin before the third hour. We did not observe any such early reaction. The specific reaction is, according to Schnürer's, Miessner's, and the writer's observations, characterized:

1. By moderate, profuse lacrimation, and pus-like, slimy secretion in the inner canthus of the eye. The degree varies considerably. Often there is only a small drop of pus; sometimes a real pyorrhea, extending in form of flakes over the entire orbital region or gumming the eyelids, and clinging to the hairs of the lids. The conjunctival sac is filled to a more or less pronounced degree with pus. The touching or the manipulation of the eyelids is in most cases extremely painful. The conjunctival membranes are deeply reddened, and in many instances there is

a marked edema of the upper and lower lid, causing, therefore, a partial closure of the opening between the lids. Occasionally in such cases a glassy appearance of the mucous membranes with small petechiæ is observed. The cornea and other portions of the eye-ball were in none of our cases involved in the inflammatory process. Special attention was paid to these observations, as several Russian investigators (Krestowsky, Wladimiroff) claim to have observed turbidities of the aqueous humor. The inflammatory process is localized on the conjunctival membranes and is a suppurative conjunctivitis.

This reaction varies considerably in different animals and in the different stages of infection, and a scale of reactions can be noted and should be reported as such. Only a discharge with leukocytes, that is to say, a purulent discharge, is to be considered as a positive reaction. There does not exist any uniformity of opinion as to this point of the reaction, which, in my opinion, is largely due to the fact that different mallein preparations have been used. All investigators (Schnürer, Meissner, and others), using the powdered mallein, agree on this point: *that only a discharge with pus can be considered a positive reaction.* In cases in which only a grayish, cigar-ash-like clump of a slimy discharge is found in the inner canthus, or in cases in which only a slight inflammatory reaction is noticeable, the reaction is regarded as questionable or doubtful, and marked (D); in all such cases, following the advice of Schnürer, a retest was made in 24 hours. The degree of pus in the discharge is marked P1, P2, P3. To specify more clearly for the beginner, reading the ophthalmic reactions, it may be said that a conjunctivitis which can, as Schnürer states, be diagnosed at a distance should be marked P3. With this as a standard reaction, after a few practical observations, the beginner will have no difficulties in distinguishing the other degrees. During the last month, the conjunctival test has been applied in Pennsylvania by many veterinarians who were never personally instructed as to the interpretation of the reaction, and still the results, as checked by the serum tests, were uniformly good and often recorded with remarkable accuracy.

2. Schnürer, Meissner, and other have noted, contrary to the statement of de Blieck, that in 73 per cent. of the horses which gave a positive ophthalmo-reaction 12 hours after the application of the ophthalmic mallein, a temperature rise of over 38.5° C. can be recorded. Schnürer emphasizes the great importance of this febrile reaction; Miessner, on the contrary, considers its recordance as not being worth the additional labor. In our cases, in about 80 per cent. of the horses tested, the rectal temperature increased from 2° to 4° F. in the 18 hours following the application of the mallein, and decreased gradually toward the 24th hour. Naturally, only afebrile cases could be tested in these experiments. This temperature reaction takes place only in animals which are actually affected with glanders. Many comparative tests on a fairly large number of healthy horses have shown that no temperature reaction takes place. A temperature reaction was noted only in those animals in which a marked ophthalmic reaction was present. The local reaction was, therefore, sufficiently distinct to constitute a diagnosis, and the tedious task of taking the temperatures with two thermometers for greater accuracy is, from a practical point of view, superfluous. Only in special cases do we use the thermic reactions as an additional criterion of the mallein test. In field work, taking the temperature can be omitted. In case temperatures are taken (advisable for scientific investigation), they should be recorded at intervals of four hours. Schnürer recommends the taking of two temperatures, namely, one at the time of application of the mallein, and one at the first reading, about 12 hours after the instillation.

Duration of the Reaction.

Usually the reaction remains visible for 12-36 hours after the application of the biologic product. There is no absolute rule. Many cases have been observed in which the local reaction was present only during six hours following its first occurrence, and, on the other hand, cases have been recorded in which the reaction remained visible for 72 hours. These observations are

in accordance with those of de Blieck, Wladimiroff, and others. We found it advisable to read the reactions from the eighth hour after the application of the mallein, as then, frequently, the early reactions are distinctly visible. A second reading should be made on the 12th-16th hour, and usually at this time the height of the reaction is present. If possible, a reading after 24 hours should also be taken. Schnürer recommends for the testing of the reactions the 12th and the 24th hour; Miessner, the 14th-20th hour after the application.

In our experience, so-called "atypical" (Schnürer) reactions occur not uncommonly; viz., the conjunctival test appears and disappears suddenly, or the reaction is distinct only after 24 hours. Several horses which were kept in our stable showed such reactions. They were mostly in the stage of acute infection.

Every precaution should of course be taken to avoid the possibility that the purulent discharge is not washed off by the stable man or caretaker; it will rarely happen that the animals, by mutual licking, will remove the discharge. From our experience, it is better not to advise the caretaker of the horses to be tested as to the interpretation of the alterations in the eyes, as otherwise the veterinarian is apt to be deceived when making retests in the same stable. In all such cases a repetition is highly recommended. Perhaps the other eye is used for the test.

Retest.

Schnürer has found that a second application of mallein will, in nearly all doubtful cases, produce a marked positive reaction, or become entirely negative. From our observations with the ophthalmic test in tuberculosis, we were quite familiar with this fact, that in a sensitized eye the reaction is more legible than in an unsensitized one. This hypersensitiveness of the conjunctival membrane as a sequel of the first application of mallein is, however, noted only in glandered but not in healthy animals. Schnürer's observations on 3,000, and our records on about 400 healthy horses have shown that a conjunctival test does not sen-

sitize as long as the animal is not infected with glanders. *Several horses were retested three and four times and still no reaction was recorded.*

Differing from the tuberculin test, the *retest can be applied 24 hours after the first application,* a very decided advantage under present conditions of city veterinary sanitary police, where in large stables a final decision is immediately desired. In most cases in which the first reaction was doubtful, a distinct or negative result was seen after the second test. Still, in two horses, which probably were in the stage of incubation, no reaction was obtained in either test. All observations stand in correlation with similar ones of Miessner, Schnürer, etc.

In many stables, all horses, including reacting (occult) ones, were retested a third time after 14 days, for the purpose of detecting such animals as were in the stage of incubation at the first and second tests, and of excluding the possibility of a simulated reaction in the reacting horses. Only when this third conjunctival test again gave negative results were the horses considered to be free from glanders.

On making this third test, and in one stable after a fourth and a fifth test, we observed that the degree of reaction became less and less distinct. Only a slight conjunctivitis was noted in animals which at first gave classic reactions. *For these reasons more than three retests should not be applied.* The mallein probably does not cause accumulation of leukocytes, and therefore no inflammatory process, on account of the adaption of the cells to the biochemic changes or on account of absence of complement concentration.

In this connection another important question should be considered, namely, after what incubation time does a recently infected animal give a positive conjunctival reaction? Müller, Gaehtgens, Aoki and Miessner have shown that the conjunctival reaction is visible from the fifth to ninth days in artifically infected animals. In one case of Müller, Gaehtgens, and Aoki, the reaction was not apparent until the 18th day after the infection. We have not conducted special experiments, as the epidemiologic

observations seemed to prove the findings of the said investigators. Fröhner concluded from the observations of Müller, Gaehtgens, and Aoki that the ophthalmic test should be preferred to the agglutination and complement fixation tests on account of the earlier positive results recorded—positive evidence when the serum test is still negative. This conclusion did not meet the approval of Miessner. My observations lead me to coincide with Fröhner. One particular case is recorded herewith.

A horse standing close to another which showed distinct glanders lesions on autopsy, developed a characteristic nasal discharge four days after it was removed from the infected stable (8-10 days after probable infection). The serum tests the first day were: agglutination 1:100; complement fixation, negative; the third day a marked ophthalmic reaction was noted; the fourth day, agglutination 1:500; complement fixation, negative. Based on the ophthalmic test, the horse was killed and glanders of the nasal septum, submaxillary lymph glands, and a few very small nodules in the lungs were demonstrated.

In a few other cases the ophthalmic test indicated distinctly the presence of a glanders infection at a time when the serum test did not indicate the slightest sign of a production of antibodies. This occurred when, as was shown by autopsy, the glanders infection was slight and caused by *B. mallei* of low virulence (experiments). In these cases the production of agglutinins took place extremely slowly and over a long period of time, as in the cases recorded by Bonome. The conjunctival test, however, gave distinct reactions and allowed an early diagnosis.

In our opinion the conjunctival test is reliable for the determination of recently infected cases and certainly is, at this stage, frequently preferable to the serum tests.

Correlation of the Conjunctival Test to the Subcutaneous Mallein Test.

The application of the subcutaneous mallein test is legally required in Pennsylvania and, therefore, the influence of this test on the conjunctival test was the subject of different obser-

vations. It is a well known fact that the subcutaneous application of mallein often suppresses somewhat the intensity of the local reactions, but this effect is, according to Foth, not marked nor of great practical importance. Many horses were tested by the subcutaneous method and afterward by the ophthalmic method and in no instance was a reaction noted when the horse was not infected with glanders. The ophthalmic test in most of the experimental cases followed the subcutaneous one in the next 24 hours. In several instances, 10-24 days elapsed before on ophthalmic test was made, and still no reaction was noted. In our experience the subcutaneous test does not influence a subsequent conjunctival test applied in the next 24 hours; a point which may be of great assistance to the practitioner. In an easy manner a doubtful temperature reaction can be checked by the ophthalmic test. As temporary febrile reactions are not uncommon in healthy draft horses, and as the failures of the subcutaneous mallein test in healthy animals, according to my statistical investigations, exceed 14 per cent., a simple test like the ophthalmic test will certainly be welcome.

The subcutaneous mallein test, on the other hand, is not influenced by a preceding ophthalmic test. In case the conjunctival test was positive, a subcutaneous test applied during the following 3-14 days, causes a reappearance of the eye reaction often to a much more distinct degree than at the time of the ophthalmic test. Animals in which such reactions occur are unquestionably affected with glanders; Schnürer says that the reappearance of past inflammatory symptoms of the conjunctiva during a subcutaneous malleinization is an absolutely conclusive proof of a glanders infection. Such conditions were frequently observed during our tests.

The simultaneous application of a subcutaneous and conjunctival test should be avoided, as in many animals during the febrile reaction a sudden fading away of the existing conjunctival reaction or a late appearance of it (after the fever has decreased) will be noted. The conditions are similar to those observed in tuberculosis (see Foth and others).

From our observations, we recommend the application of the

conjunctival test first and, if necessary, the subcutaneous test in the second place and not in the reversed succession.

Results Obtained and General Conclusions.

In considering all the details mentioned, 210 horses were tested, from April until July. Since that date, about 400 additional horses were tested, checked by the serum tests and subsequent retests, but, as far as the autopsies and conjunctival tests are concerned, were not under my supervision. In the following table, therefore, are included only my own observations on 210 horses. The additional tests were as satisfactory as the experimental tests, and the deductions can, therefore, be applied to about 600 horses.

All our examinations as to the worth of the conjunctival reaction were conducted in conjunction with the laboratory tests, particularly the complement fixation and agglutination tests. The readings of the conjunctival reaction were made by the writer or by a trained assistant or agent of the Pennsylvania State Livestock Sanitary Board. The blood for the serum tests was collected before the mallein was instilled. The serum tests were all conducted by my first assistant under personal supervision in the laboratory, as usual and in the manner described in a recent publication. The autopsies of the animals found to be affected with glanders were conducted either in the post-mortem room of the School of Veterinary Medicine, or in the field, in the presence of the writer. In a few instances where clinical cases were diagnosed, a detailed autopsy was omitted when the *B. mallei* had been isolated from the organs or secretions submitted for examination. As quite a few veterinarians stil consider the Strauss reaction to be the chief diagnostic method for glanders, material is frequently submitted for laboratory diagnosis without our request, and has been successfully used for the inoculations mentioned before a test was applied. In rare cases the animals were tested only by the ophthalmic method and were killed before the serum tests were concluded. In such cases the

autopsies were made with particular care and, if necessary, animals were inoculated. The material was not especially selected but came from different outbreaks of glanders which came to the notice of the Pennsylvania State Livestock Sanitary Board. In most instances the animals tested did not show any clinical symptoms (occult cases of glanders) and thus gave the conjunctival test a more severe trial.

The results show that of 210 horses, 58 were found by means of the complement fixation test to be suffering from glanders. The interpretation of this test is based on the principle as outlined by Miessner and others and shown in my publication on this subject. Statistical investigations (see publications from 1909-12) show that 99.6 per cent. correct results in glanders and 99.75 per cent. in healthy horses are obtained with the complement fixation test. Of the 58 glanders cases, only 56 reacted positively to the conjunctival test, while two horses which proved at post-mortem to be affected with glanders did not give any reaction whatever. On account of the positive serum reactions, both animals were condemned and, therefore, a third retest at 14 days' interval could not be carried out. The two animals, Nos. 206 and 208, were, according to the history and the result of the serum tests, in the stage of incubation and would probably have shown a positive reaction on a third retest. In the experimental horse No. 28 conditions observed by Müller, Gaehtgens, and Aoki were therefore existing, namely, *in quite recent infections the conjunctival tests may be negative and occur only several days after the appearance of the antibodies in the serum of the patient.* Whether or not this is an exception has to be determined by further observations. We found lately that these conditions are rare.

The retest, 14 days after the first test, gave, with a few exceptions, distinct results. Miessner concluded from his observations that in many cases, probably on account of a certain adaptation (also in glanders horses), only a slight reaction will be noted. In his opinion, only the complement fixation test should be used for a retest in a stable. In our opinion, the sec-

ond serum test can very readily be combined with a third ophthalmic test.

As previously explained, the subcutaneous mallein test (legal requirement) was applied several times at 14-day intervals. The horses became gradually used to the mallein and did not show any febrile reactions, and yet the ophthalmic mallein test was, in all instances, positive. This fact is of great importance, particularly when the serum tests, on account of a previous mallein application, are misleading. In horses that are maliciously injected with mallein to veil the results of a subsequent test by a state official, the conjunctival test will be of great assistance in disclosing the true condition. So far as we know, the use of antipyretics to falsify the mallein test is not commonly practiced, and the results of the ophthalmic test under these conditions have to be determined. Experiments for this purpose are in progress. In what manner the mallein vaccine used in New York City influences the conjunctival test has also to be determined. Practical experience has shown that the serum tests are misleading (over a long period agglutinins and complement-fixing antibodies are present).

In other diseases, particularly sporotrichosis, with all its clinical similarities to glanders, a positive reaction to the ophthalmic test was never obtained.

To give a few examples of the readings of the reactions, two characteristic cases are selected. The limited space at our disposal will not permit the giving of all the readings in detail as has been done in other publications (Schnürer, Fröhner, Reinhardt, Miessner, and others).

No. 1. Horse, bay gelding; temperature 100.8° F. at 9 p. m. Showed 10-5-12, 10 hours after the application of the ophthalmic mallein, severe lacrimation, photophobia, profuse purulent discharge, temperature 104.8.

Serum test.—Complement fixation, 0.05 binding value, agglutination 1:200. The animal was retested 29-7-12 and showed for three days a severe purulent discharge, lacrimation, and photophobia. Complement fixation 0.05, agglutination 1:400.

This animal was killed and the autopsy showed four old glanders foci in lungs and two large cheesy glanders nodules in the bronchial lymph glands.

No. 2. Horse, bay, 10 years old, weight 1,300 lbs., condition very good; submaxillary lymph glands, slightly hardened; few small nodules 10 inches above the haunch. Ophthalmic mallein applied 8 p. m. First observation 8 a. m., 8-10-12, eye showed slight lacrimation and photophobia. At the inner canthus of the eye was a very small amount of whitish slimy material. Second test applied 8-10-12, 10 p. m. First observations 8 a. m., 8-11-12. Excessive lacrimation, pronounced, photophobia, edematous swelling of the lids, and considerable amount of whitish yellow pus-like discharge at the inner canthus. Complement fixation 0.02; agglutination 1:1500.

Post-mortem examination.—Glanders of the lungs, the bronchial and submaxillary lymph glands and integumentum.

It is also shown that not one of the healthy horses gave a positive ophthalmic reaction. That these horses were really not affected with glanders was proven primarily by successive serum tests and a careful observation and control during the last five months of all the stables in which the test was applied. No further cases of glanders have developed and the disease can, therefore, be considered as having been eradicated. In several of the stables, only recently serum tests were conducted and not one of the animals has reacted. The results obtained in the healthy horses correspond with those mentioned by Reinhardt, Wladimiroff, Klimmer (11), Dedjulin (12), Miessner, and others; 100 per cent. correct results were obtained by these investigators. Schnürer reports 22.3 per cent. failures in testing 5,450 animals. These results are based upon reports which were submitted by veterinarians, many of whom had not the training necessary to interpret the reactions. Such mistakes will undoubtedly be eliminated in the future when the method has become perfectly familiar to the profession. In apparently healthy horses a reaction to the conjunctival test followed by failure to demonstrate anatomical lesions certainly should not be considered as proof

of the inefficiency of this test. Everyone familiar with the results of the tuberculin test will be prepared to admit that also in glanders similar conditions occasionally prevail, and that only a most careful autopsy will reveal minute anatomical lesions. As autopsies are not very agreeable to the veterinarian under usual conditions, the number of failures reported out of a large number of animals tested will naturally be greater than are recorded in the few tests in this paper.

All in all, the conjunctival method certainly cannot be blamed for these failures, and, compared with the subcutaneous mallein test, the results obtained are remarkably accurate. In addition, the simple manner of application, the relief from time-absorbing taking of temperatures with all its disadvantages, will certainly place this test in the first rank of the diagnostic methods for glanders.

The Results Compared with the Complement Fixation and Agglutination Tests.

In the interest of a perfect sanitary control, a centralized record system of all glanders cases must be maintained. To enforce such a legalized system it is nescessary that the diagnosis of glanders be established independently of the practitioner, especially as the state is giving compensation for the destruction of the animals. The checking of the field tests for glanders and the confirmation of the diagnosis is most efficiently done in the state of Pennsylvania by the serum tests.

The results are compared with similar observations of Dedjulin and Miessner. We have noted the very satisfactory and remarkably accurate results with the complement fixation test. In a recent publication special emphasis has been paid to this fact (13).

As mentioned before, in the state of Pennsylvania the use of the subcutaneous mallein test is still required. It was therefore not surprising to find that several sera in our tests gave positive reactions in the complement fixation test when there was no sign whatever of glanders, and when the retest proved that

such animals were not suffering from the disease. We had 3.2 per cent. failures in the healthy horses and attribute this fact to the production of immune bodies by previous injections of mallein. *We earnestly request, therefore, that the proper authorities arrange that when a serum test is to be applied, no subcutaneous mallein test be made; a request which is reasonable on account of the facts explained, and which has been recognized as proper procedure in Prussia (for the last four years).* The veterinary sanitary laws of Prussia forbid the use of mallein (subcutaneously) on account of its effect on the interpretation of the serum tests.

The agglutination test, in considering 1:800 a reaction, showed rather unfavorable results, as by it alone only 74.5 per cent. of the actual cases would have been detected. By it 2.6 per cent. of the healthy horses gave a positive reaction, and might have been considered as suffering from glanders. The agglutination test alone would therefore have been very unreliable. This observation has been critically discussed in my last publication. It is impossible to mark a certain *limes titre* as an indication of a positive reaction. Only reactions of 1:2000 and above this titre can be considered as conclusive. Since the introduction of the complement fixation test, we use the agglutination test as a control only for the period of incubation, and never has a diagnosis been made based solely on the result of the agglutination test. We will retain the agglutination test as a laboratory method and not follow the proposal of Miessner to replace the agglutination test by the conjunctival test. These conclusions stand in correlation with those of Schnürer, Fröhner, Reinhardt, and others.

A few observations were made as to the effect of the ophthalmic mallein on the serum reactions. In no instance was an increase of the agglutinins and complement-fixing antibodies noted. The observations of Miessner made on glandered horses are not conclusive, as animals were selected in which the increase of the antibodies as a natural sequel of the infection was to be expected.

Conclusions and Recommendations.

In considering these investigations, the following conclusions can be drawn:

1. The conjunctival test for glanders is very reliable. It can, in a short time, without large expense, be applied by every practicing veterinarian and will permit the untrained to make a diagnosis of glanders with the greatest possible accuracy.

2. The serum tests are necessary to centralize the control of infectious diseases in a reliable state institution and to support the diagnosis in case compensation is sought by the owner of the animal. Only the complement fixation test can be used independently for the diagnosis of glanders.

In fulfilling these requirements, the following plan is recommended: The practicing veterinarian obtains from the state laboratory the mallein preparation, eye-droppers, test tubes, and needles for the collection of blood. On a special report blank the number, name, and position of the horses in the stable are noted. Then blood is collected (carefully considering the precautions mentioned in a special circular letter), marked in correspondence with the numbers on the report, and immediately forwarded to the laboratory. Simultaneously, a conjunctival test is made by dropping into the conjunctival sac (on the mucous membrane of the lower lid) two drops of a 5 per cent. (1 per cent.) solution of "mallein siccum." The solution must be made shortly before use. About 10-24 hours afterward, two examinations of the instilled eye are to be made. The degree of reaction is best marked on the report as follows:

Absence of reaction	N
A slimy discharge	D
A purulent discharge	P1
A purulent discharge and swelling of the eyelids	P2
An abundant purulent discharge with photophobia, lacrimation, etc	P3-P4

In cases where a doubtful reaction is obtained, a retest on the same eye with the same amount of mallein is made after the

reading (20-24 hours after the first application). After 8-20 hours the eye is examined again and the result noted. All reacting animals are to be carefully isolated. In considering the result of the complement fixation and agglutination tests, the animals affected with glanders are proposed for destruction and if possible disposed of.

Fourteen days after the isolation, or better, the destruction, of the glandered horses, a third retest of the remaining animals, including, perhaps, the doubtful reactors, with ophthalmic mallein and the serum tests is made. Should further cases of glanders be detected by the third, a *third repetition of the serum test alone* should be ordered. The subcutaneous mallein method should be omitted, or in case it has been applied, proper information should be sent to the one conducting the tests.

This plan for the diagnosing of glanders has been used with success during the last few monfhs in the state of Pennsylvania.

BIBLIOGRAPHY.

1. *Bull. de la Soc. centr. de méd. vét.*, 1907, 61, p. 359.
2. *Ibid.*
3. *Ztschr. f. Infektionskrankh. usw. d. Haustiere*, 1910, 7, p. 418.
4. *Ztschr. f. Infektionskrankh. usw. d. Haustiere*, 1908, 4, p. 216; *ibid.*, 1912, 10, pp. 321 and 408; *Deutsche tierarztl. Wchnschr.*, 1910, 18, p. 65.
5. *Ztschr. f. Immunitätsf.*, 1911, 8, p. 626.
6. *Monatschr. f. prakt. Tierh.*, 1912, 23, p. 1; *ibid.*, p. 433.
7. *Monatschr. f. prakt. Tierh.*, 1911, 23, p. 178.
8. *Centralbl. f. Bakteriol.*, Abt. I, O., 1912, 63, p. 482.
9. *Handbuch der Technik und Methodik der Immunitätsforschung*, Supplement I, 1911, p. 394; *ibid.*, 1908, 1, p. 1190.
10. *Ztschr. f. Tiermedizin*, 1911, p. 401; *Ueber die Gewinnung eines festen Malleins und über seine Bedeutung usw.*, Berlin, 1896.
11. *Handbuch der Serum-Therapie und Serum-Diagnostik in der Veterinär Medizin*, 1911, p. 321.
12. *Ztschr. f. Infektionskrankh. usw. d. Haustiere*, 1912, 15, p. 365.
13. K. F. Meyer, *Proc. of the Amer. Vet. Med. Assn.*, 1912.

KANSAS CITY VETERINARY COLLEGE.—The practicing firm at the college was reorganized May 1, when Dr. T. S. Hickman severed his connections to enter business for himself, with offices and hospital at 1818 Cherry street, Kansas City, Mo. Dr. W. G. Keehn was engaged in the place of Dr. Hickman. The firm now includes Dr. S. Stewart, Dr. F. F. Brown, Dr. J. Victor Lacroix, Dr. A. Trickett and Dr. C. D. Folse.

THE PRINCIPLES OF HORSE SHOEING.*

By David W. Cochran, D.V.S., New York, N. Y.

This is a very complex subject, and one which allows a great deal of debate, both for and against any theory which may be brought forth.

Diseases affecting the lungs, liver, kidneys and all other internal organs of the horse are mostly similar to those affecting the same organs in man; and we have learned much and profited to a great degree, from the investigations of pathologists, who have written upon and taught so much that is valuable upon those subjects. The pathology of the diseases causing lameness in the horse, including the various phenomena attendant thereof, and the circumstances surrounding the animals' usefulness and existence differ in many respects from similar conditions affecting man. The structures involved are different in kind, have different requirements to fulfill, are differently located, and are subject to vicissitudes and many casualties.

The diseases themselves are *sui generis,* consequently but little knowledge can be gleaned from works on human surgery relating to, or helping our diagnosis or treatment of such cases. The veterinarian is to some extent thrown upon his own resources for obtaining information respecting these matters. For this and many other urgent reasons, investigation and study of cause and effect, in all diseased conditions affecting the soundness of feet and limbs, should be intelligently and unceasingly continued for a correct appreciation of the management of the horse's foot as well as a consideration of shoeing in its triple importance, that of protector to the base of the superstructure (the hoof)

* Read before the May meeting of the Veterinary Medical Association of New York City. Published in Cornell Veterinarian, Vol II, No. 2.

an aid to progression and a remedier of defects, when foot and limbs are defective. Since the horse is useful to man only by means of his movements, his foot deserves the most careful attention. For the proper manifestation of his strength, and the full development of his useful qualities the horse must rely upon the soundness of his feet, since in them are concentrated the efforts created elsewhere and upon them depend, not only the sum total of these propulsive powers being profitably expended, but the solidity and just equilibrium of the whole animal fabric are subordinate to their integrity.

The literature on horse shoeing is often misleading. Books have been written by men, who may be termed, "One Idea Men." They have personal theories of their own, which, derived from discovery, resulted in benefit to one horse. Their theories are then claimed to be applicable to all horses' feet. However, I am not going to decry any kind of a shoe. I am no opponent of novelties, for progress in real knowledge involves change.

There are several breeds of horses to contend with, viz.: the draught horse, the business horse, the express horse, the trotting horse, the running horse, the saddle horse, and the show horse. Each and every calling demands a different style and form of shoe. A shoe which would be desirable for one horse would be very undesirable for another. Every horse has an individuality of his own. There is often a difference in all four feet of the one horse. But no matter what may be the class of horse, the object of horse shoeing is primarily to protect the hoof from wear; secondly, to constitute a guard against injuries; thirdly, to maintain and restore the due proportions of the foot with its active functions unimpaired; fourthly, to obtain security of foothold.

Firm Foothold.—Firm foothold is the first condition of any progression whatever. It enables a horse to develop his utmost power with ease and comfort with the least expenditure of force.

The next step will be to examine the position of his limbs

in relation to the bearing surfaces of his feet with the ground surface. Any deviation of the foot from an imaginary line drawn through the centre of the long axis of his limb can be detected whether it be to the inside or outside. The ground surface should be directly transverse to this imaginary line. If the pastern is inclined inward to this imaginary line, the inside quarter will be sustaining all the body weight. Consequently, it will be lower than the outside quarter. In that case to bring the foot to a square bearing we will have to lower the outside quarter of the hoof—or if the ankle be bent outward, then the inside quarter will be too high and will have to be lowered.

In order to insure soundness of limb and ease in progression, it is very essential before the shoe is applied, that the bearing surfaces of the hoof be levelled and brought to perform their proper function, namely, equal bearing from heel to toe and a justly proportioned depth at toe and heel.

Foot Level.—To see if a horse's foot is level. When you pick up his foot, hold the leg by the cannon bone, just above the fetlock joint. The foot will then hang down naturally. You can then see which side is too high, whereas if you hold the foot in your hand or by the pastern you cannot be sure—but that you are twisting the foot one way or the other. You may be led to think one side is higher than the other when such is not the case.

The scope of horse shoeing is by no means narrow and insignificant, since a knowledge of veterinary science and of the foot in particular is necessary. It is evident that the art of shoeing should be taught to students with demonstrations upon dissected material and upon the living horse. It is not intended that the student of veterinary science should be a practical workman, but he should know how to make a critical examination, how to direct, how and what should be required. Practice without theory is simply routine work without improvement. Theory alone, is impotent, to confer advantages without the crucial test of experience. Horse shoeing, though apparently simple, involves many difficulties owing to the fact that the foot is not an

unchanging body, but varies much with respect to form, growth, quality and elasticity. Furthermore, there are such great differences in the character of the ground surfaces and in the nature of the horses' work that shoeing that is not done with care and ability induces diseases and makes horses lame. As long as bones, articulations, muscles and tendons remain healthy, just so long will the legs maintain their natural direction and position. Frequently, however, this normal condition of the limb is gradually altered by disease of the bones, joints and tendons, and defects in the form and action of the lower parts of the limb arise that often require attention in shoeing. If in shoeing consideration be given to the structure and function of the hoof, particularly of the foot and the fit of the shoe, we need have no fear of subsequent diseases of the hoofs, provided the horse is used with reason and receives proper care.

The preparation of the foot is the first step before any shoe can be applied. It is immaterial of what style or pattern the shoe may be, the foot must be properly prepared to receive it. There must be first, a level surface, although this may not be a proper term. There must be a surface to meet another surface, so that they will fit closely. Two surfaces may be at any angle and both surfaces lie in juxtaposition. When I speak of a level surface, I mean one which will lie as near as possible to a right angle with a plumb line, or a plumb line striking four right angles. Faulty foot level causing one sided wear of the shoe and faulty action, uneven setting down of the foot, an unnatural course of the wall, must be regulated by peculiarities of the shoe. Since the shoe is an artificial base of support, a proper surface is of the greatest importance in preserving the soundness of the feet and limbs. Shoes designed for various forms of hoof must present equally great and equally numerous differences of form. The condition of the foot and nature of the work decide what form of shoe is best suited.

We will now take up the coarse anatomy of the parts, which we will divide into two orders: The internal, vital or organized structure; and the external, insensible or horny portion. Though

mutually dependent, one upon the other during the life of the animal, these parts can only be satisfactorily examined when separated after death. One of the primary considerations for those having charge of shoeing the equine foot should be a knowledge of its structure and functions in health. When we come to examine it, we find it has for its bases, the three bones of the digital region—the os coronæ, the os naviculare and the os pedis. The latter is more particularly the foundation of the foot and the nucleus on which the hoof is moulded. On the pyramid eminence of the os pedis we have the attachment of the anterior extension of the phalanges. On the semi-lunar crest of the os pedis, we have the attachment of the flexor pedis perforans. These tendons are the chief auxiliaries in the act of progression. The navicular or small sesamoid is placed transversely between the wings of the os pedis and articulates with the os pedis and the os coronæ. Its function is to throw the flexor tendon further from the centre of motion, thus increasing its powers. The tendon glides over the lower or posterior part of the bone. The bend which the tendon makes in passing over the bone, causes this part of the foot to be one particularly subject to diseases. We have also the complementary apparatus of the hoof known as the two lateral fibro cartilages and the plantar cushion. These are admirably disposed to sustain weight, prevent jar, and insure that lightness and springiness which form so striking a feature in the horse's movements. Besides the elastic apparatus, we have the wonderful arrangement of living membrane, the keratogenous membrane enveloping the frame work of the foot like a sock and the hoof enclosing all as a shoe does the human foot. The keratogenous membrane is divided into three subdivisions: The coronary cushion which is the matrix of the wall of the foot; the velvety tissue, the formative organ of the sole and frog; and the animal or podophyllous tissue, a name it gets by exhibiting leaves on its superficies, running parallel to each other, separated by deep channels and dovetailed into analogous leaves on the inner side of the wall of the hoof.

The hoof considered as a whole, represents a box that envelops the inferior extremity of the digit. This is the part which comes more immediately under the care and manipulative skill of the farrier. For convenience and simplicity it has been divided into wall, sole, frog and coronary band, or periople. The wall is that part of the hoof which is apparent when the foot rests on the ground. The middle or anterior part of the horny envelope is known as the toe; the two sides as the inside and the outside toe or spur; the lateral regions as the quarters. The heels are formed by the angles of flexion at the extremities; while these extremities themselves passing along the inner border of the sole form the bars. When examined with regard to the direction it effects, in its relation with the ground surface, it is seen to be much inclined at the toe. The obliquity gradually diminishes until it reaches back of the quarters. At this point it is nearly perpendicular.

The coronary frog band or periople forms on the upper part of the wall a kind of ring continuous with the bulbs of the plantar cushion and with the frog. It is a thin horny layer which gives the external part of the wall a smooth, polished, shining appearance. The sole is a thick horny plate, concave in form, comprised between the inner border of the wall and its reflected prolongations (the bars). It occupies the inferior face of the hoof. The external or large circumference is united to the wall by means of denticulæ. The internal border or small circumference is a deep V shaped notch, widest behind, corresponding to the inflection of the bars. At the bottom of the small circumference is the attachment of the frog. The frog is a mass of horn, pyramidal in shape, and lodged between the two re-entering portions of the wall.

The Elastic Tissues of the Foot.—All bodies which, under traction or pressure, change their form and return again to their normal shape, as soon as traction or pressure ceases, are called elastic or springy. Nearly all the parts of the horse's foot except the bones possess more or less elasticity. The lateral cartilages and the plantar cushion are very elastic. The coronary

band, the laminæ, the articular cartilages, the horny box or hoof are less elastic. These characteristics are possessed by the respective parts of the foot in accordance with their function, location and structure.

The plantar cushion is composed partly of yellow elastic and white fibrous tissue with adipose cells distributed throughout its substance. It is similar in shape to the horny frog and lies between it and the perforans tendon.

The bulbs of the heel are formed by the posterior thicker part, which lie between the lateral cartilages and is divided by a medium cleft. We have a suspensory ligament of the plantar cushion, also an elastic ligament which connects the os suffraginis and lateral cartilage and unites with the plantar cushion.

The next consideration will be the growth of the foot, for the foot in an unshod condition depends on growth for wear and repair and for efficient protection. Without this process, the farrier's art would quickly be of no avail.

The growth of horn takes place by a deposition of new material from the secreting surface from above-downward and so regular is the growth generally in every part of the hoof that it would appear that the secreting membranes are endowed with equal activity throughout. The wall of a healthy foot grows in a downward and forward direction at about the rate of ¼ of an inch per month.

With the exception of the horny leaves of the wall and the bars, all the horn of the hoof is composed of horn tubes and intertubular horn. These run in a downward and forward direction parallel to the direction of the wall at the toe.

Shape of the Foot.—On inspecting the unshod foot of a four year old colt, it has been the fashion of veterinary writers to consider its ground surface as a circle. In reality there is a great inequality of its two sides, not only as to additional thickness of the wall on the outer quarter in comparison to the inner, but also to the still greater circularity. The outer half furnishes far more than is necessary to form a half circle, while the inside half is generally much less than a semi-circle. The bulge or

excess of width on the outside quarter is most apparent toward the heel, forming a broader base of support for the superstructure than the inside quarter. The inside column of the wall, being lighter and yet placed under the center of gravity, is more liable to diseased conditions than the outer quarter. It is generally lower than the outer quarter.

Physiology of the Foot.—We may say that a foot is never at rest. Contraction and expansion are going on all the time when in perfect health. The most marked changes of expansion and contraction occur when the foot bears the greatest weight, namely, at the time of the greatest descent of the fetlock. We then have the flexor tendon pressing down on the plantar cushion, as well as the descent of the sole, causing a spreading of the wall. The movements of the different structures of the foot and the changes of form that occur at every step are indispensable to the health of the foot. The wall is the weight bearing portion of the hoof, the bars afford solid bearing to the posterior part of the foot and give additional strength. They act as buttresses and assist in the expansion of the foot. The lateral cartilages form an elastic wall to the sensitive foot and their movements caused by lateral contraction and expansion, assist the venous circulation. When weight comes on the foot, it is relieved by a yielding foot articulation, on elastic walls, bars and frog and through these on the plantar cushion. The elastic posterior wall is pressed outward by the compressed frog on the plantar cushion and it slightly expands from the ground surface to the coronet. At the moment of expansion, the bulbs of the heels of the foot at the coronary edges sink under the body weight and come nearer the ground. The pedal bone slightly descends through its connection with the sensitive laminæ and presses the sole down with it while the walls of the foot diminish in height under compression. Under these conditions the blood pressure of the veins in the foot increases and the blood vessels are emptied. When weight is removed from the foot, the blood vessels fill and the frog and posterior walls contract. The bulbs of the heel rise and the foot becomes narrower from side to side.

At the same time the anterior edge of the coronet goes forward and the pedal bone and sole descend. The object of this expansion and contraction is to assist the venous circulation and counteract concussion.

A hoof while supporting the body weight has a different form and the tissues enclosed within it a different position, than when not bearing weight. The intermissions of the internal pressure, even in the standing animal, are continually changing. The changes in form take place in the following manner: the body weight from above (upon the os coronæ, os pedis, and navicular bone, when the foot is placed on the ground), is transmitted through the sensitive laminæ and horny laminæ to the wall. At the instant the fetlock reaches its lowest point the os pedis bears the greatest weight. Under the body weight the latter yields and in conjunction with the navicular bone, sinks downward and backward. At the same time the upper posterior portion of the os coronæ passes backward and downward between the lateral cartilages which project above the upper border of the wall and presses the perforans tendon down on the plantar cushion. The plantar cushion being compressed from above and being unable to expand downward is therefore squeezed out toward the sides and crowded against the lateral cartilages and they, yielding, press against and push before them the walls at the quarters. The resistance of the earth acts upon the plantar surface of the hoof, especially on the frog and it, widening, pushes the bars apart and in this manner contributes to the expansion of the quarters, especially at their plantar border. Lateral expansion over the entire region of the quarters occurs simultaneously at the coronary and plantar borders. This expansion is small and varies from one-twelfth to one-eighth of an inch. The horny sole under descent and pressure of the os pedis sinks a little and the arch becomes more flattened. There are three highly elastic organs which are involved in these movements: the lateral cartilages, plantar cushion and the horny frog. To maintain these elastic tissues in proper activity, regular exercise, with protection against drying out of the foot, is indispensable, for the dif-

ferent movements of the foot, and the changes of form that occur, at each step, are dependent on them for preserving the foot in health.

The Circulation or Blood Supply of the Foot.—The digital arteries originate just above the fetlock passing over the inner and outer sides of the fetlock joint accompanied by veins and nerves of the same name. Each runs down the side of the digit inside the lateral cartilages to the superior border of the wing of the os pedis, thence they reach the tendinous surface of the bone and terminate at the plantar foramina on either side of the insertion of the flexor pedis perforans. They give off the following branches which are regarded as arteries of the foot: the perpendicular, the transverse, the artery of the *frog* or plantar cushion, the preplantar ungual and the plantar ungual.

The perpendicular artery arises at right angles below the middle of the os suffraginis, descends on the side of the digit, inclines forward and terminates above the coronary band by anastomosing with its fellow, their union forming the superficial coronary arch which supplies the coronary band with blood.

The transverse artery is given off under the lateral cartilages, passes forward between the front of the os coronæ and the extensor tendon and joins its fellow forming the deep coronary arch, supplying the surrounding parts with blood.

The artery of the *frog* or plantar cushion arises behind the pastern joint at the superior part of the lateral cartilages, enters the sensitive frog and divides into anterior and posterior branches. It supplies the sensitive frog with blood.

The preplantar ungual is given off just back of the wing of the os pedis, passes through the notch in the wing and along the preplantar groove in the wall of the bone, at the anterior extremity of which it terminates by several branches which enter the os pedis and anastamose with the circulus arteriosus or semi lunar anastamosis. Before entering the bone two branches are given off which supply the bulbs of the frog and the lateral cartilages with blood.

The plantar ungual is the terminal branch of the digital. It

passes through the plantar foramen on the tendinous surface of the os pedis and enters the bone, within which it joins its fellow forming the circulus arteriosus or plantar arcade, from which spring ascending and descending branches. The former are the anterior laminal which leave the bone through the numerous openings on its wall supplying the sensitive laminæ with blood. The descending branches are the inferior communicating arteries which average fourteen in number. They pass through the foraminæ or openings situated just below the edge of the os pedis and unite outside to form the circumflex artery, which runs around the toe giving off ascending branches to the sensitive laminæ and about fourteen descending (solar arteries) which supply the sensitive sole and unite posteriorly to form the inferior circumflex artery.

The veins are arranged in an external and internal interosseous network. They are valveless, allowing the blood to flow in either direction during sudden emergency. We have three systems of veins. The solar plexus is made up of a large number of veins which unite to form the large circumflex vein which accompanies the artery of the same name, passes back to the wing of the os pedis and thence to the coronary plexus. The laminal plexus arises on the sensitive laminæ, the veins of which gradually increase in size as they approach the coronet where they terminate in the coronary plexus. The coronary plexus surrounds the os coronæ and the upper part of the os pedis extending backwards below the lateral cartilage and is formed by the veins of the solar and laminal plexus. The veins of the frog extend over the external surface of the sensitive frog, ascending the sides of the lateral cartilage and unite to form a large vein, which, with branches from the coronary plexus, runs up the side of the os coronæ all uniting near the upper part of the bone to form the digital vein. The internal or interosseous veins of the foot originate at the circulus arteriosus or plantar arcade. They pass out of the bone through the plantar foramen, then up the inner side of the lateral cartilages and unite with branches of the coronary plexus.

I have recited to you the physiological action of the foot. I will now take up the pathology. Anything that interferes with the dilatability of the hoof produces an abnormal condition, and must interfere with the vascular structure, and nerves contained therein, producing atrophy of the tissues (from diminished nutrition) and pain (from pressure on nerves). When any interference with the dilatability of the foot is permanent, it produces a dimunition in size of the organ. Contraction may be total or partial. In the first case we have increased concavity of the sole, and atrophy of the frog. The quarters and heels assume a vertical position. From long rest in the stable, without exercise, we may have that form known as stable founder or sub acute laminitis. We have in these forms a drying out of the foot, an alteration of structure, an improper distribution of body weight, on ligamentous structures and hoof. The toes may be too long, the quarters curve inward.

The causes of contraction are heredity, inaction of the animal due to stabulation and *pain* whether in the foot or other parts of the leg.

The characteristic appearance of a contracted foot is sufficient to allow of its recognition. The foot is ovoid from side to side and appearances show an increased antero-posterior diameter. The heels are high, the frog atrophied and affected with thrush. Lastly, the muscles of the shoulder become atrophied; this is an important point to note: the appearance of the muscular covering. Is the spine of the scapula prominent with a thin covering of muscle above it? Is the point of the shoulder prominent giving hollowness to the chest in front? If so, you have indications of diseases of the feet. Always view with suspicion a horse even if he is going sound, if the muscles are wasted, particularly at the superior portion of the shoulder. Since contraction is the parent of nearly all diseases of the foot, proper care, proper hygienic conditions, will prevent it to a great degree.

There is another form of contraction I wish to call your attention to, that is, contraction of wide hoofs. It manifests itself as a concavity or groove in the wall just below the coronet usually

at the heels and quarters. Green horses with wide hoofs just from the pasture are liable to this form of contraction. The lameness is severe but generally disappears as the foot grows down and has assumed its natural straight direction by growing down from the coronary band.

The Flight or Extension of the Foot.—From the moment the foot leaves the ground until it alights again we have a rotation of the limb and foot to a greater or less degree. In the act of extension there is a bending of the knee and ankle outward, swinging in the form of an arc of a circle. While the foot is in transit, there is a slanting of the foot inward, before it reaches the ground surface. Since it is in this position at the moment it reaches the ground surface, the foot strikes the ground surface at an angle, in most cases the outside toe striking the ground surface first, the outside heel nearly simultaneously with it, and when the body weight is placed on the foot, it rotates inward toward the center of gravity, or under the center of the body weight. The next act is the roll over at the toe. The higher the outside toe the more the rotation and the more weight falls on the inside quarter. This is one of the principal causes of most all foot ailments. It is a form of rocker or oscillating motion. First, the outside toe then the outside heel, then the inside quarter and then a roll over at the front of the toe. It is this rotation of the pastern joint which is also the cause of all interfering whether at the knee, ankle or shin. It is also one of the causes of quarter cracks, broken bars, corns and raised cartilages. This is where a proper foot level is demanded to insure an even tread of foot. As a sequel of this rotation when the foot is not properly prepared, we have an improper distribution of the body weight over the hoof and we have malformation of joints, due to strains of ligamentous structure.

We have conditions known as talipes dextral and talipes sinstral. A bending of the pastern and hoof either to the right or left; it is often due to faulty conformation as a result of heredity. This condition is found chiefly in long legged horses with narrow chests. These are inclined to be bad interfering

horses. These horses need especially shaped shoes to rectify the faulty conformation.

In talipes dextra or extreme toe out, we have the rotation spoken of in the greater degree. The wear on the outside branch of the shoe is intensified while the inside branch is not touched at all. This one sided wear or uneven setting down of the foot produces an unnatural course of the wall. A shoe for this kind of a foot is dependent on the structure, direction and position of the leg and foot. We must strive to have uniform setting down of the hoof and uniform wear of the shoe. Every point at the coronary band in the posterior half of the foot must receive support from the shoe. If for example, the coronet on the outer quarter projects beyond the plantar border of the quarter, the outer branch of the shoe from the last nail hole back must be kept full so that an imaginary perpendicular line from the coronary band will just be in line with the outer border of the shoe, or if you stand directly in front of the leg and look back you should be able to see the shoe all the ways on both sides.

The Wear of the Shoe.—Caused by the friction on the ground surface, often times it is evidence of disease and infirmities (when worn very much at the toe). In chronic laminitis when worn at the heels. Excessive wear on one side may be due to narrow fitting or where the curve of the shoe is not sufficiently large. In fitting shoes they should be a little longer and a little wider than the foot, to accommodate the downward and forward growth of the foot.

In fitting shoes to feet of normal shape, we follow the contour of the wall as far as the quarters and from there backward. The shoe is fitted wider and longer than the foot to maintain a good base of support as well as to accommodate the downward and forward growth of the foot. Shoes should always be put on even. The cleft of the frog being in the centre of the foot, both branches of the shoe should be equi-distant from it.

In hoofs of irregular form we must consider the position of the limb and the distribution of weight on the hoof, because

where the most weight falls, the surface support of the foot must be widened, or more material to wear on that branch.

The bar shoe is a pathological shoe. It is used for prophylactive as well as for curative purposes. It protects from pressure diseased portions of the foot and allows part of the body weight to be borne by the frog, and restores normal activity to the disturbed physiological movements of the foot. Laminitis, corns, uneven wear, disturbances of continuity, as quarter cracks, toe cracks or any injuries to the foot indicate its use.

DR. JENSEN CONVALESCENT.—His many friends will be grieved to learn that Dr. H. Jensen was confined to his bed for several weeks in April and May by an attack of inflammatory rheumatism. The doctor is just beginning to get about again.

ACKNOWLEDGMENTS FOR MAY.—Cattle Tick Eradication, by Charles F. Dawson, M.D., D.V.S., Veterinary Division, State Board of Health, Florida; Bacterial Therapist; Veterinary Edition—The Rocky Mountain Collegian, Fort Collins; Bulletin No. 32, Agr. Research Institute Pusa; Canker and Other Diseases of the Foot of Horses, J. D. E. Holmes, M.A., D.Sc., M.R.C.V.S.; Mulford's Veterinary Bulletin for April; Veterinary Standard, Grand Rapids, Mich.; Rider and Driver; Our Dumb Animals; Breeder's Gazette; Research Bulletin No. 28, University of Wisconsin Agr. Exp. Sta.—Avian Tuberculosis, by E. G. Hastings and J. G. Halpin; Hoard's Dairyman; Report of Proceedings Sixteenth Annual Meeting U. S. Live Stock Sanitary Association; Farmers Advocate, Winnipeg; Philippine Journal of Science; Philippine Agricultural Review; Journal of U. S. Cavalry Association for May; Bulletin No. 16 Dept. of Agr., Health of Animals Branch, Warble Flies, by Seymour Hadwen, D.V.Sc.; Bulletin No. 160 U. S. Dept. of Agr., B. A. I., Care of the Farm Egg, by Harry M. Lamon and Charles L. Opperman; Sixth Annual Report of Live Stock Sanitary Board of North Dakota; Circular No. 12 Mich. Agr. College Exp. Sta., Tuberculosis in Fowls; Quarterly Record, North Dakota Agr. College; Prospectus Grand Rapids Veterinary College; Report New York State Veterinary College; Directory of Virginia Breeders of Pure-Bred Live Stock, Animal Husbandry Dept., Va. Polytech. Inst., and several others.

ANTHRAX VACCINATION, ITS USE AND ABUSE.*

By J. Arthur Goodwin, D.V.S., New Iberia, La.

Upon request of the chairman of your arrangements committee to present a paper at this meeting on some phase of the Charbon question, the subject being such a familiar one and covered so many times by others, left very little choice in the selection of a title; however, in casting about for a line of thought it occurred to the writer that the rank and file of our profession would be interested in hearing something concerning the use and abuse of anthrax vaccination as observed by one located in the heart of the anthrax district. If at times it becomes necessary to criticise the vaccinating products of some of the manufacturers, or their methods of distributing same, it is done without malice or enmity towards any, and with a full realization that in this day of intense commercialism the uppermost thought is concerning volume and not scientific results. Besides, the selling policy of biological houses in this country is, undoubtedly, not controlled by scientists.

Anthrax vaccination was first worked out by the great Pasteur between the years of 1880 and 1882, using attenuated cultures of the Bacillus Anthracis, and with slight modifications the Pasteur method is used at the present time with varying results. Our present knowledge embraces three methods of immunizing against anthrax, viz.: The Pasteur method; the sero-vaccine method, and the bacterin method, wherein the dead spores and bacilli are held together in pill form. The Pasteur method, when properly applied, offers the best means of immunizing animals against anthrax. The sero-vaccine method has been used to a very little extent in this country, though very gratifying results

* Read before the annual meeting of the Louisiana Veterinary Medical Association, New Orleans, February 26, 1913.

have been obtained by its use in Germany. The bacterin method, so far as the observation of the writer has gone, is practically worthless, as will be shown later. We have for consideration then two methods only, since the sero-vaccine is not yet available in this country, hence the reason for omitting a description of it in this paper, as it could serve no practical purpose at this time.

It is admitted that the use of anthrax vaccine is for the purpose of protecting or immunizing animals against anthrax or charbon, and the veterinarian is not unreasonable in expecting a reliable, potent product from the manufacturer who offers such for sale; neither is it unreasonable for the client to expect his animals to be thoroughly immunized when a qualified practitioner is employed to do the work. Thus it will be seen that the manufacturer plays a most important part.

The method most employed in this section is the Pasteur double lymph, which consists of the injection hypodermically of the first and second lymphs at intervals of 10 to 12 days. Do not confound the term Pasteur method with the name, Pasteur's vaccine, as the latter is simply a trade name for one make of vaccine. The dose varies according to the manufacturer, from ⅛ c.c. to 1 c.c., and it is most important that the syringe used is in perfect working order. A single-dose vaccine of an attenuated virus made in France is for use in large herds, where it is impractical to administer a second dose. The virility of this vaccine is rated higher than the Pasteur first lymph, but somewhat weaker than the second. In his bulletin on "Anthrax with Special Reference to the Production of Immunity," Dr. Charles F. Dawson, of the Delaware College Agricultural Experiment Station, mentions a case of a pregnant cow having been given a dose of this vaccine, and in fifteen days later she was inoculated with 0.2 c.c. of virulent anthrax bacilli from a 24-hour culture, which had killed a check rabbit and a check cow in 48 hours. The cow in this instance withstood the disease, and several other important phenomena were observed, but they are omitted here, for the reason that they are not germane to the subject.

In the application of anthrax vaccine the hypersusceptibility

of some animals must be taken into account, though this is quite difficult to observe unless the operator has had the opportunity of previous observation. During the writer's experience in vaccinating, no fatal results have followed in cases of hypersusceptibility, and is convinced that with a vaccine properly prepared and properly administered in minimum doses, very little, if any, fear need be entertained on this point. In order to safeguard or avoid cases of exaggerated effects in vaccination, care should be taken that no animal is vaccinated that is ill or shows an elevation of temperature. No careful operator will disregard this precaution.

When a vaccine fails to produce signs of having taken effect —not even a slight rise in the temperature—in an animal which has not been previously vaccinated, it may safely be concluded that the preparation was inert, and revaccination is necessary with an assured fresh product. It is almost certain that a varying degree of immunity is produced in all animals, even when the very best of vaccine is used, and the writer has noticed that the resistance to a natural infection exists in direct proportion to the effect of the vaccine. In plain, those animals showing the more pronounced reaction after vaccination are the ones which are most likely to escape the disease, though surrounded with every avenue of infection.

It must be admitted that in some cases protection is not secured when potent vaccine and proper administration are used, an animal dying occasionally in supposedly immune herds. It is the writer's opinion that in such cases the resistance of the animal body is heightened by a superlative degree of perfection in the condition of the blood and lymphatics, which enable the resistant influences to overcome the intruding vaccine before remaining in the system sufficient time to produce immunity. An explanation in support of this, to which let us apply the term non-susceptibility, is found in the fact that identical doses injected into animals of the same age, weight and apparent condition do not always produce the same symptoms, rise of temperature and duration of illness. The question naturally arises: How is one to

differentiate between the impotency of vaccine and the non-susceptibility of the animal to a minimum dose, when the vaccine does not take effect? In dealing with large herds which had not been vaccinated the previous season, it would be readily apparent, if no effects of vaccination were perceptible, that the vaccine was not up to the standard; while with a single animal, if the operator is familiar with the vaccine, having used some of the same series, prior to the occurrence, with satisfactory results, a conclusion of non-susceptibility is reached. When such cases are found, the writer has no hesitancy in doubling the dose of vaccine and proceeding at once with its administration.

Based upon several years' observation, it has been noticed that very often recovery takes place from a natural infection after the animal has undergone the proper vaccination. A conservative estimate of such recoveries is at least one out of three, whereas the mortality without vaccination is given by some authorities at 80 to 90 per cent., but in this section it comes nearer to 95 to 100 per cent.

It is important to note that when animals are subjected to vaccination once every twelve months, after the first time, subsequent vaccinations do not produce any perceptible reaction. When vaccination is done early in the season, say March or April, the stock can be continued at work with little or no harm, but it is strongly advised against during the excessively hot months of June, July or August.

Procrastination causes a large unnecessary loss each year in this section. For some reason the largest portion of the stock owners put off the vaccinating of their stock until the appearance of the disease, when it is extremely difficult to secure immunization. Before applying the vaccine it is necessary to remove the animals from pasture, feed on hay not home grown (peavine excepted) and screening against the stinging horse flies (tabanidae) if present. It is at this time that the parties who earlier in the season viewed with indifference the importance of having their animals immunized, realize the necessity of vaccination, and the work that should be stretched out during a period of 45

to 90 days is crowded into two or three weeks. It frequently happens that the services of the local veterinarian are not available, due to other pressing work, and it is then that some parties do their own vaccinating.

The writer has been called often to outbreaks of anthrax on farms and plantations, where the disease has been known to occur almost every year for ten years or more. A little investigation found that during that time no sanitary precautions were taken in the disposition of the diseased carcasses. If they did not die in a pasture, the bodies were hauled there for disintegration. It is needless to say that flocks of buzzards very ably assisted in the work of destroying the carcasses, but they were unconscious of the fact that they were at the same time carrying for later distribution the deadly germs, the propagation of which was to mean more carcasses.

The usual method of vaccination was resorted to; that is, following the directions of the manufacturers in using the stipulated dose. On such, what might be termed, badly infected places only partly beneficial results were obtained. Deaths would occur after immunity was supposed to have been conferred, and as the people were very incredulous and skeptical about new things, it can be appreciated that the lot of the veterinarian just then was unenvied.

Hyperimmunity.

Through dire necessity something had to be done, and it was at this time that the writer resorted to larger doses of vaccine, and subsequently the application of a method evolved for the purpose of producing hyperimmunity. It was reasoned that if immunity could be secured against the invasion of a few anthrax spores, why not hyperimmunity against a larger number of the infective organisms? With this idea in view, the stock on these badly infected places were gone over four separate times, and in some instances as many as six times. The writer could see no reason why the animal body could not be made to withstand large doses of the vaccine, and, with this end in view, experi-

mented with 16 head of range ponies, two having died of anthrax on being put back on pasture after immunity was supposed to have been conferred. Bear in mind that these ponies (18 in all) had received the minimum dose of the 1st and 2d lymph ten days apart and were returned to the pasture known to be infected after 25 days. After 31 days from the first injection of lymph No. 1, these ponies were gone over again, using double doses of the same vaccine, Nos. 1 and 2 nine days apart, and after six days from the last injection triple doses of Nos. 1 and 2 were given eight days apart. It will be seen that these ponies received a total of six doses each of vaccine during a period of 54 days. After the two ponies had died, the remaining 16 head were again removed from the pasture and kept off until 10 days after the completion of the experiment. It is regrettable that the writer had no facilities to test the degree of immunity thus acquired other than to subject them to infection from the same pasture. This happened during the season of 1911, and up to a few months ago not one of these ponies had died, though they were again vaccinated in 1912 with double doses of the 1st and 2d lymph. This method has been employed in a number of other outbreaks with the very best of results, and the writer has no hesitancy in advising its use when the situation becomes grave enough to warrant it. In vaccinating for clients who desire early protection, the writer has resorted to a systematic increase of dosage each year until two full doses have been reached. This, undoubtedly, also raises the immunity.

Abuse.

In taking up the discussion of the abuse of anthrax vaccination, it is done with the full knowledge that the manufacturer, distributor and lay-user of the various vaccinating products will take these observations and criticisms as antagonistic to their rights and privileges, but let us assure them now that nothing is further from the mind. The motives which prompt us to bring out these abuses are actuated by a thorough desire to further perfect this valuable means of conserving thousands of dollars'

worth of high-priced live stock, and if any appreciable degree of success is attained, the writer will feel amply repaid for being placed in this unpleasant position.

Our connection as veterinarian with some of the large planting interests, which require numbers of mules, with absolute control over the stock in health and disease, has made it possible to make extensive observations on the various vaccines, their efficacy and influence from year to year over animals known to us.

It must be admitted, even by the most unscrupulous distributors of vaccine, that next in importance after its potency is the proper administration. It can be said without fear of contradiction that this is one of the worst abuses in existence to-day. In support of this contention let us quote from a paper by Dr. W. H. Dalrymple, on "Immunizing Agents and Therapeutic Sera," read before the 1911 meeting of the American Veterinary Medical Association: "However, in order to secure the maximum of success with these products (anthrax vaccines), in addition to what has already been stated, their use ought to be solely in the hands of qualified veterinarians, as there are certain antiseptic precautions necessary to success with such products, with which the layman is not expected to be familiar; furthermore, in the judgment of the writer, it would add greatly to the success of preventive vaccination against anthrax, and save a great deal of valuable live stock property, if the manufacturers of these products would lend their aid in seeing to it that only qualified veterinary practitioners could handle vaccines of this character." Quite frequently large abscesses form at the seat of injection, when done by those not familiar with the work, and we have been called to see many such cases where the owner thought his animal was going to die of charbon, being ignorant of the nature of the swelling. If the manufacturer could hear all the condemnation that is poured out about his vaccine, just at this time, very little persuasion would be necessary to secure the use of anthrax vaccines for the exclusive use of veterinarians.

In consequence of the use of unsterile syringe and needle

and infected site for injection, it is but natural that the introduction of streptococci or staphylococci takes place, which is not calculated to assist in the immunization, and if these bacteria do not assist in the destruction of the vaccine, it undoubtedly localizes it, preventing absorption, thus defeating the end sought. It is not at all surprising that these things do happen when it is known that one syringe and needle very often does service for an entire neighborhood, with a total disregard for the necessary antiseptic precautions. Thus it happens that when vaccines used in this manner by the layman, do not produce perfect results, vaccination and everything connected with it is pronounced a " fake."

In the season of 1910, after being assured by the manufacturer that the product was dependable, the writer made very extensive use of the bacterin single-dose method with anything but gratifying results. The advantages of a single vaccine to a busy practitioner are exceedingly luring, and many of us have been led to its use solely on account of its convenience. It is our firm opinion that this form of immunization is entirely without efficacy. It was found to be " Safe and Harmless," but without the much advertised " Reliability." As much as 20 doses were injected experimentally into one animal, demonstrating that it was safe and harmless, while three separate doses injected within 40 days failed to immunize. The most disastrous experience occurred, however, in one lot of 100 head of stock, in which 50 or more died from anthrax 60 days after the vaccine had been applied. Numerous other cases can be cited to show that this preparation has no practical value in protecting against anthrax, but it would only be a repetition, in a smaller way, of what has been said. The experience of the writer with this product does not differ much from the other veterinarians in this section, as will be brought out in the discussion. If further proof is needed to show that it has no value as an immunizing product, the experiments described by Dr. Dawson, whose bulletin has already been referred to, would seem to bear one out. Dr. Dawson says: "A commercial vaccine which, according to the makers, consists of dead anthrax organisms in pill form was also tested. These

small pills are placed under the skin by means of a trocar and are claimed by the makers to produce immunity to anthrax. Microscopic examinations, as well as cultural and animal experiments show that the claim of the makers, in so far as the vaccine being dead and harmless is concerned, is true. One can easily see with the microscope that these little pills consist of dead anthrax bacilli and their spores held together in pill form by a proper excipient. The writer was unable, however, to verify the claim that they produce any immunity. A rabbit succumbed in six days, but as it is very rarely that a rabbit can be immunized by a vaccine, a sheep, which animal is easily protected, was also employed with negative results."

The present system of distributing vaccines are prejudicial to its best use. While the manufacturers are honest in their claim that they do not serve the laity, it is a matter of common knowledge that any of the various makes of vaccine can be procured by the layman through the retail druggist, accompanied by literature explaining in detail how it is to be used. When it is known that some of the vaccines cannot be exchanged for fresh goods, it is easy to conceive how the unscrupulous druggist can dispose of his stock of old vaccine rather than it becoming a dead loss.

Another abuse in vaccines, which should be corrected by legislation or otherwise, is the failure of the manufacturers to standardize same. We can point to the indifferent results obtained with antidiphtheritic serum before its standardization, to realize the improvement that would be secured.

It is the hope of the writer that one day the appropriations to the State Live Stock Sanitary Board will be such as to enable them to fit up a modern laboratory for the production of a reliable standardized anthrax vaccine, such a preparation to be distributed under the control of the Board for the exclusive use of its approved veterinarians. It is then, and only then, these abuses will stop.

THE YORK COUNTY VETERINARY MEDICAL ASSOCIATION will meet at York, June 3.

EPICTETUS, ETHICS AND ESTHETICS.*

By W. Harry Lynch, D.V.S., Portland, Me.

When I began to prepare this paper for this meeting, my mind wandered over the familiar ills by which we are all encompassed—influenza, colics, punctures, lameness and azoturia; at lameness I paused for a little while, considering its availability; but finally decided against it. My time would hardly allow for a beginning of this comprehensive subject. However, I have it in my mind to keep rather near topics of interest to us all, and I wish also to incorporate into this paper, a little of the "wisdom of the ancients" to whom we are all very much beholden for their philosophy, their discriminating insight into life, for the genuine flavor in their works, just as apparent to-day as nineteen centuries since, when Arrian wrote down for us the sayings of his master in Nicopolis.

In one of his "discourses" Epictetus says: "You can be invincible, if you enter into no conflict in which it is not in your power to conquer." When we begin thinking of the practitioners of veterinary medicine we have known, we begin sorting them out in two classes—those who have succeeded and those who have had less success, in relativity to business instinct possessed by them, or their lack of it. We seldom see superior professional skill followed by financial success since the scientist who is focussing his attention upon his science, is probably giving little thought to accumulation of dollars.

Looking backward to your college days, you at once remember the clever men who certainly possessed brains enough to be brilliant in the field—men who went by the mediocre rank and

* Presented to the Maine Veterinary Medical Association, January, 1913.

file of the class like meteors—easily taking honors, medals and scholarships, their very genius which was not an " infinite capacity for taking pains," but a facile superficiality which has often been their undoing, and the average man has passed them long ago in the race for success.

The prophylaxis and therapeusis of disease in animals is a business as well as a profession, and this truth must engage our attention early. Altruism is a beautiful thing—correlating if not comprising esthetics—but business is business. We spend ourselves, our time, our money in acquiring a science that must maintain us. Infinite research that does not end at the door of our Alma Mater, but must go on all our professional days if we would keep up at all with what is doing in professional fields; devoting an occasional hour or two as now to meeting together for discussion of the different needs for which we must be as one man in our firm stand for what is right and needful in the state, that the veterinarian is not hampered in his efforts in stamping out disease, and raising health standards. Here are common grounds where we meet shoulder to shoulder for the common good, where our united strength must serve to impress all who come in contact with us. Apart from this what feeling superimposes?

The feeling that we are alone, each in his sphere of action, and whether we admit it to ourselves or not, our brothers are our rivals; though I think it is in our power to make it a friendly rivalry. The young licentiate can hardly help looking wistfully at the prosperous establishment of an older man in the field who has gained a large and profitable clientele, forgotten the weary days of waiting to " arrive."

We are crowded in the field wherever the work is worth while. We cross each others path, caring for the livestock of our brother while he is traveling miles to attend those of our neighbor, which we naturally consider quite uncomplimentary as well as unnecessary.

Success in our field means ability to handle cases and clients, too. Tact, candor and simplicity are as much needed for our

clients as diagnosis and therapeutics for our patients. The doctor who makes a mistake in diagnosing, and gets by it tactfully, may fare better than the over cautious practitioner who does not often blunder, but when he does, has no tact in concealing it.

It is, fortunately a little past the day of the lightning diagnostician, and a better educated horse owner appreciates the careful and painstaking efforts of a veterinarian who leaves nothing to chance—appreciates, too, it may be, the possibility of mixed infection, concentrating all his attention upon the illness he is called upon to treat.

There is certainly a wide gulf between the veterinary know-it-all who leaps to a conclusion, and the man who hesitates to call the name of the disease; the golden mean being the man who can successfully impress the owner of an animal with his ability to treat the ills that may threaten him a financial loss.

The candor which induces a man to say I do not know! when asked what is the matter with some of our well known trotters and pacers, may do in that case, but sometimes saying it to an average man will make him feel as conversant with the case as yourself, on a footing with you, and he may suggest some quack remedies that have wrought " wonderful cures."

I find that my friend Epictetus was acquainted with sellers of quack remedies, so we have not altered essentially in that respect. But to resume: One is not bound to either specifically name a disease, or say: I do not know. He may go over the symptoms, hope for different signs of improvement at the next visit—depending a bit, upon care being taken to obey his directions in his absence, and possibilities of metastasis. If one says I don't know, when he sees a patient blowing, with a high temperature, and, returning next day finds laminitis when pulmonary trouble was just as imminent, he may find a quick and positive diagnostician in command—one who came later when the symptoms were more defined.

Clients not only wish to know what ails their horses, but how long till they can go to work and an estimate of cost of treatment. A dignified scientist who takes his art too seriously, is

apt to handle this situation tactlessly; his vagueness is likely to create distrust in his clients' minds as to his experience and capability. If he has seen such cases before, surely he can give some definite opinion. Right here it is easy to fall from the Scylla of optimism to the Charybdis of pessimism. The middle course is to base opinions on averages which may reasonably transpire to be correct as to larger details. If we have erred in our diagnosis, and worse, given it in a bombastic way, our sin is twofold, for our client might feel merciful to the mistakes of a modest man, but it is a safe guess that he will be merciless to a cocksure brother, and will waste no time in making it clear to that individual. It is a matter of business with the animal's owner, and he has little thought of our professional dignity, which is equally involved in the matter of giving out any information which will not subsequently be borne out by events. Men in business generally appreciate a veterinarian's saying: the animal will probably go to work in so much time, and the cost of treatment will be so many dollars—giving time and amount, but say definitely this is only an estimate, it is impossible to tell exactly, something may depend upon the co-operation you receive from the man or men in the stable. Personally, I do not care to practice anywhere, where I do not have the earnest efforts of the men in the stable concerted with my professional calls. I have before this, lost promising patients where I am reasonably sure that had my orders as to nursing and nourishment been faithfully carried out, would have recovered. Those cases where vitality has been lowered, requiring frequent feeding in small quantities, of carefully selected sorts—cases where medicine has played its part and time must do the rest, these are the times when the right man in the stable is valuable to the owner; also the time when the wrong man in the stable is a detriment to us.

I have had some experience in contract work, and thus opportunities to note its advantages, which are chiefly, that it is extremely business-like.

It may, however, cause the business man to hold the professional man too cheap—expect too much, and the veterinarian may

become careless in details of accurate bookkeeping, unless his professional enthusiasm sustains his high standards.

The man with whom we have a contract may think we should visit his lame horse every day, while we are sure that two or three times a week will amply suffice for the variety of lameness we are treating, and, unless we are good demonstrators and make this very clear he will not be satisfied. When all his horses are well and no occasion for the veterinarian to do more than look them over at stated intervals, he is apt to regret the contract and feel he is spending money needlessly. Enter an epidemic in the community it looks very different, when he is getting so much more than the terms of the contract require. The successful man may here create a demand for his medicines, orders coming in and being filled, profitably. It is to be regretted that this easy and profitable side of our business is utilized by the venders of remedies who advertise while we do not.

There was a man who went to Rome on a matter of law and consulted Epictetus as to the probable outcome of his suit. The philosopher told him that "if he went to Rome with the right opinions he would fare well; but if he went with wrong opinions he would fare ill, for, to every man the cause of his acting is his opinion." Still further quoting we find: "that if we apply ourselves as diligently to our work as did the old men of Rome to the matters in which they were employed, we might learn something." I think perhaps, we might myself. Is it not a consummation to be wished for, to raise our standards, eliminate forever from the minds of the people, the empirical "hoss doctor" and fill the place with the trained scientist, the bacteriologist, the man who is familiar with the relation of the health of the silent creatures to the people, and who seeks to promote and establish the health of both by stamping our disease from his order of patients?

I realize that this task is one calling for the strength of Hercules, but if we work as one man for the incorporation of these ideals, in our tasks, we will soon usher in a better day. To this end, let us unite our forces.

THE EFFECT OF HOOF EXPANDERS.*

By James McDonough, D.V.S., Montclair, N. J.

It is unnecessary for me to go into details concerning the conditions that we try to avoid, or relieve, by the use of expanders; so I will confine my remarks to the influence upon the shape of the hoof, as I understand it.

Our object, when applying expanders, is to spread the hoof at the back; and their pressure is so great in the direction that we wish the heels to spread, that there seems but little doubt, that our purpose will be accomplished. And if we take a measurement of the heels at the point of the wall, before the expanders are applied, and again a month later, we will feel that the required results have been accomplished; as a very perceptible increase in their width can now be detected.

As convincing as this proof may appear to us of the efficiency of expanders, yet I think a careful study of their influences upon the shape of the hoof will cause us to hesitate before indorsing them.

If we relieve conditions resulting from contractions we must spread, not alone the inferior border of the wall at the heels, but all of that part of the hoof behind the quarters, the horny sole included. If we expect to accomplish this by the use of expanders, I fear we are doomed to disappointment, as the sole, as well as the wall above, cannot follow the direction of the expander, nor can the expander follow the direction of the sole and wall above, during expansion, and as the two are united the result is that neither can move, until such time as the growth of the heels will permit the spring to force them apart in the direction of the *lateral diameter* of the foot. This accounts for the in-

* Read before the Veterinary Medical Asociation of New Jersey, at Jersey City, January, 1913.

creased width of the heels at that point, when the spring is removed, but the pressure upon the lateral cartilages has not been relieved nor can it be, until the heels have been spread in the direction of the *circumference* of the hoof.

I will show you here a model of a hoof hinged at the quarter allowing the heels to be separated with the greatest freedom, but if we close the heel and introduce an expander, we will find that the heels cannot be forced apart for the reason already explained.

I also offer for your inspection, a model of a hoof, made from thin sheet lead, its shape at the heels can readily be changed by the pressure of the thumb and forefinger, but this very strong expander introduced on the 23d day of September, has failed to spread the heels a fraction of an inch, although a very great and constant pressure has now been applied at that point for 108 days, with practically no resistance, only that offered by the inability of the heels to follow the direction in which the spring is trying to move.

To relieve contraction, the heels must be forced apart in the direction of the *circumference* of the hoof. This can only be accomplished by the use of a spring having a movable attachment, for the reason that the heels, during expansion, move outward and backward, while the points of the expander move outward and forward. In other words, the hoof is made longer, while the spring becomes shorter.

I wish to call your attention to one of the heels of this lead model. You will see that where the end of the spring is inserted and for a distance of two inches forward of that point, the edge of the wall is *drawn under* and *curled over in the direction of the sole*. As ridiculous as this statement may sound, the expander is producing in this heel, *the very condition it was intended to relieve*.

For this reason, some ten years ago I had some expanders made for my own use provided with a little flange at the end to be inserted into a grove made in the wall at the heel. This permits the one to glide upon the other, thereby allowing the

heel to move in a backward direction, and the end of the expander in a forward direction during expansion of the two.

I solicit a liberal discussion of this subject by those present; some of whom have had very much more experience than myself. I am already indebted to you for past favors, for your intelligent discussion of subjects brought before this association, has made it possible for me to even suggest the presence of a condition.

I am particularly desirous of hearing your opinion upon this subject, as I do not feel justified in assuming the entire responsibility of advising against the use of expanders, since they have been indorsed by so many.

I object to their further use for the reason that should I be right in my conclusion, as to their effect upon the hoofs, their use should be discontinued, for they not only fail to relieve contraction, but prevent the natural expansion of the heels, so essential for the animal's comfort, when the foot comes in contact with the ground.

NOTE.—This paper was freely discussed at the meeting where it was presented, but merits a much wider discussion by the profession in general, to whom the REVIEW's pages are freely offered. We have always been advocates of hoof expanders, but many of the points in Dr. McDonough's arguments against them are well taken, and the subject worthy of careful study. We hope that men who have had experience in the use of expanders will express themselves freely that the subject may be better understood by the profession generally.—[EDITOR.]

ALUMNI DINNER OF NEW YORK-AMERICAN VETERINARY COLLEGE AT NEW YORK ATHLETIC CLUB, May 8, proved a very impressive and pleasant affair. Prominent men outside of the veterinary profession, Chancellor Brown of New York University, Dr. John P. Munn of the University Council, Principal Grange of the Ontario Veterinary College, members of the faculty and prominent alumni of the school from distant cities were among the speakers. The excellence of the cuisine and the artistic surroundings in the beautiful room in which the dinner was held, played no small part in making the occasion the best held for many years, as was universally expressed by those present before departing for their homes.

SERUM THERAPY IN PRACTICE.*

By A. R. Menary, D.V.M., Cedar Rapids, Iowa.

Under this head I will merely mention the results we have obtained in our practice, with the use of some of the serums, bacterins, vaccines, etc., assuming, of course, that you are all familiar with the diseases treated.

Tuberculin.—Tuberculin in our practice has proved absolutely reliable. In tests on 1,800 cattle a few years ago 13 per cent. reacted, and every one of the reactors were killed and found by government inspection to be tubercular. These tests were made at different seasons of the year and on days of varying temperature. In the present year 500 cattle have been tested with only 3 per cent. reacted.

The foregoing tests show that the reliability of tuberculins as a diagnostic agent, but in both these tests the state dairy commissioner has been somewhat antagonistic.

Mallein.—Mallein has not proved to be as reliable a diagnostic agent as tuberculin. In a test on 22 horses and colts, the mallein test showed 8 reactors. Blood of these 8 reactors was sent to Washington for a precipitation test. The precipitation test showed a positive reaction on 6 and a negative reaction on 2. This would lead one to believe that there is a more reliable test for glanders than mallein. We would like to hear more on these double tests.

Anti-Strangles Vaccine.—Anti-strangles vaccine, of which there are two or three varieties, some of which are recommended both for strangles and influenza as a cure and preventative has done some work for us. In a herd of 30 pure bred imported stallion and mares, a preventative vaccine immunized the animals to influenza.

---

* Presented to the twenty-fifth anniversary of the Iowa Veterinary Association at Ames, November, 1912—Reprinted from published report.

There were about 15 animals on this same place affected with influenza at the time of vaccination.

The curative agent has been used on horses sick with distemper and working on the city streets. Sub-maxillary abscesses were opened at the time of injection. One injection in some cases seems to be sufficient to cure or at least prevent any further trouble or complications.

CANINE DISTEMPER BACTERIN.—Canine distemper bacterin has done some wonderful work for us. We have treated dogs of all sizes and all breeds. I will cite a few cases.

Collie dog about one year old. Had been treated about one week with Glovers Distemper Cure.

Symptoms.—Purulent discharge from eyes and nose and had not eaten much for a week. Severe cough, temperature 104.5 some diarrhea and vomiting.

Treatment.—One 2 c.c. Ampule of canine Distemper bacterin. Injected subcutaneously, back of the shoulders.

Results.—In two days discharge from eyes and nose was more profuse. In five days discharge was practically dry. Dog was playful and was anxious to eat the small amount of feed recommended.

We have had practically the same symptoms and same results in Boston bulls, English setters, bull terrier, and fox terrier.

We have vaccinated well dogs that were exposed as much as 6 months ago but have not yet come down with the disease.

TETANUS ANTITOXIN.—We have used tetanus antitoxin only as a prophylactic. We have a great many horses to treat, that pick up rusty nails on the city streets and in alleys. In all our cases we use 1,500 units of antitoxin immediately the case is received. Not one case of tetanus has ever followed this treatment.

On the other hand, I feel safe in saying that 65 per cent. of those cases treated by the laity for four or five days, subsequently develop tetanus.

BLACK LEG VACCINE.—Black leg vaccine in all its forms has proved to be absolutely reliable, so much so, that where 500

calves used to be vaccinated, there are now only about 50 vaccinated.

Black legoids in the farmers hands have not been much of a factor in our vicinity.

Poly Valent Bacterins.—Poly bacterins cannot be condemned or recommended to any great extent. We have had good and bad results in all cases. We had good results in quittors, fistulas, and navel ill with only one ampule or one tablet of bacterins.

Again we have used a dozen doses on cases that were apparently the same as the others, and got practically no results.

Those two gray mares that we operated on for fistulas at last year's clinic, were treated with bacterins and antiseptics for 6 months after the clinic. During this time the fistulous tracts were opened up for drainage three times.

One mare is now apparently healed and the other is still running.

We have not used autogenous bacterins to any great extent.

Hog Cholera Vaccine.—As there are a good many other talks on hog cholera I will just mention our results.

We used one serum, simulatneous method, on about 1,200 hogs obtaining fresh serum every day. About 500 of these hogs died with cholera, two or three weeks after vaccination. The peculiar thing about it was that one day they would send a potent virus with a weak serum and the next day they would send a potent serum and a weak virus.

We obtained serum from another firm, used the simultaneous method, and got good results on about 500 hogs, however, we tested this firm's virus by injecting 2 c.c. into a hog weighing 75 pounds. At the same time we injected 2 c.c. of virus from a third firm. In seven days the first hog with 5 c.c. virus was hale and hearty, while the second with 2 c.c. virus had been off feed for two days and had a temperature of 108. This hog died on the 9th day.

It looks to us as though some one besides the man who makes hog cholera vaccine should test both serum and virus.

SOME EXPERIENCES WITH HOG CHOLERA.*

By F. F. Parker, D.V.M., Oskaloosa, Iowa.

Not wishing to be misunderstood in my attitude toward hog cholera serum, as my subsequent statements may imply, I want to state plainly that I think the discovery and implied uses of this serum, taken from an economical standpoint, the most important of any.

Hog cholera and swine plague have been very prevalent in Mahaska county for the last two seasons, but more especially in the last three months, many farmers losing their entire herds. August 17th I was called to a client's farm to ascertain if possible the cause of sickness among his hogs. Post-mortem examination showed cholera. On August 20th we vaccinated sixty-five head, using serum only. There were from twelve to fifteen of these shoats sick at this time, but we vaccinated them with the rest. In about ten days these hogs began dying so fast that I made a second call and another post-mortem which showed apparent lesions of both hog cholera and swine plague. About two-thirds of this herd died. This outbreak seemed to be in a very chronic form, some of them lingering along for a month or more before dying.

On August 24th vaccinated one hundred head for a client who had previously lost three from it several more being sick when vaccinated. Two-thirds of this herd survived. That same day across the road from this herd, I vaccinated twenty-one shoats, none of which had been sick, using vaccine from the same lot. All were immunized. This was the only instance where serum alone was used when there had been no previous exposure; but owing to closeness of two herds, I deemed it safest.

August 28th I vaccinated fifty-eight head of shoats, seven brood sows due to farrow in a very few days and one male hog,

* Presented to the twenty-fifth anniversary of the Iowa Veterinary Association at Ames, November, 1912—Reprinted from published report.

weight 600 pounds. All were perfectly healthy, and as nice a bunch of hogs as I have ever seen, and had not been previously exposed to cholera.

I used the double vaccination with utmost care as to sterilization, asepis, and exactness of dosage. In three or four days from this time these sows farrowed sixty-nine live healthy looking pigs. On the eighth day after vaccination every hog became sick except two, the largest sow and the boar. The owner having had experience with cholera in previous years, as had also his sympathizing neighbors, called me by telephone to come and see those hogs as they all had cholera and looked like they were going to die. I had previously prepared him for the possible loss of two or three but not for anything like this. These hogs had every symptom of virulent hog cholera, the characteristic fœtid feces, the catarrhal discharge from the nose and eyes and red spots on abdomen and ears; these spots turning purple before death. Some died in a few days, others lingering for three or four weeks. All but seventeen of the fifty-eight shoats died, three of the sows and all of the sixty-nine little pigs. I thought their death due partly to mother's condition.

The last herd vaccinated was 135 head that were being shipped through Ottumwa and by mistake were unloaded in the Morrell Packing Company pens. Dr. Anderson, chief inspector at Ottumwa, tells me that these pens are never free from cholera. These hogs remained in these pens four days before being vaccinated. I used the serum only. They were shipped at once to their destination at Parnell, Iowa, and I ascertained afterward from the owner that he had not lost any of these hogs.

In conclusion, will say that I have not advised the use of the serum nearly as strong as I would have liked to, on account of the loss of those healthy hogs for this one man. His loss was considerable as he had an abundance of feed this year but was afraid to buy other hogs and start anew for fear of them becoming infected. He was very liberal in his feeling toward me, entirely exonerating me from all blame, but at the same time I could not conscientiously advise him to repeat the experiment.

SUGGESTIONS ON SANITATION.*

By J. W. Griffith, D.V.M., Cedar Rapids, Ia.

The inspection of our food supply is by no means a recent idea. This is especially true of meat, some form of inspection of which, has been carried on for centuries. It has been systematized and placed on a scientific basis however, as our knowledge of bacteriology and pathology has been developed. We must admit nevertheless, that our inspection is still crude in certain particulars, very incomplete when the supply as a whole is considered and looked upon by the most of the laity as unnecessary or as an excuse for some veterinarian to secure a "job." It is a well known fact, that no line of professional work has been developed by those who do not understand the necessity for, and the principles underlying such work. It is apparent therefore, that the veterinary profession must extend and develop our inspection service which in the future will undoubtedly be one of the most important branches of our work. This must be done by educating the public, securing proper legislation and according this branch of work the attention it deserves.

The education of the public can be accomplished by calling attention to the ease with which our food supply may be contaminated, more especially our milk supply which has been very much neglected, and by calling attention to the results of consuming unwholesome, diseased foods by our unsuspecting public. We should not lose sight of the fact that an organism falling on meat usually remains an organism but the same organism falling into milk may multiply to thousands or millions before it reaches the consumer, and that milk on account of its nature and manner of

* Presented to the twenty-fifth anniversary of the Iowa Veterinary Association at Ames, November, 1912—Reprinted from published report.

production and handling, is much more readily contaminated than most other food products.

Conditions vary in practically every city and locality, and no one plan or system will operate successfully in detail under these varied conditions. This difficulty could be overcome by having a state law authorizing each city to establish inspection service by adopting an ordinance which would apply to the conditions existing in that particular city. This work should have the support and co-operation of the Animal Health Commission as it is a part of the sanitary work of the state.

Each city should have an abattoir where all animals, not passing under Bureau of Animal Industry inspection should be slaughtered and inspected by a competent veterinarian employed by the city.

In connection with the milk supply it must be remembered that it is more important that the source of our milk supply be sanitary and healthy, than is the presence of a certain amount of butter fat. Milk diluted one half with water is by far more desirable than milk containing an abundance of butter fat, yet acts as a distributing agent for typhoid, tubercle and a large number of disease producing organisms. In other words the first and most important requisite to insure a supply of good clean milk, is a healthy cow kept and milked under proper hygienic and sanitary conditions. No after treatment of the milk can fully compensate for a lack of these conditions. Pasteurization which is often advocated to render impure milk pure, is, as generally carried out, a farce and in more than one instance has supposedly pasteurized milk been found to be loaded with filth and disease.

THE WASHINGTON STATE VETERINARY MEDICAL ASSOCIATION will meet at Wenatchee, June 19 and 20. We trust that the weather conditions at that time will be ideal (the time of meeting having been postponed on account of storms) and that a strong representation of the veterinarians of the state will find it convenient to be present.

REPORTS OF CASES.

OCULAR TUMORS WITH CASE REPORTS.

By A. T. KINSLEY, Pathologist, Kansas City Veterinary College.

Ocular tumors are quite common, in fact, they are more prevalent than one would suspect from the information obtainable from veterinary literature.

Puschmann reported 53 cases in No. 1291 of the *Veterinary Record.*

H. M. Graefke reported an ocular neoplasm in the *Kansas City Veterinary College Quarterly,* March, 1910. In the *Missouri Valley Veterinary Journal,* June, 1910, the writer reported 16 cases of malignant orbital tumors, of which 10 affected the eyeball and related structures. A Spindle cell sarcoma of the eyelid of a mule, which later involved the structure of the eye, was reported in Vol. 29 of the AMERICAN VETERINARY REVIEW, and in Vol. 31 of the AMERICAN VETERINARY REVIEW, four cases of ocular epithelioma were reported by the writer. Loeb and Jobson reported 48 cases of squamous celled carcinoma of the lachrymal caruncle of cattle.

Sarcoma and epithelioma are the most common malignant tumors that involve the eye and adjacent structures. Carcinoma and endothelioma have been demonstrated in a few instances. Of the benign tumors, papilloma, fibroma, and myoma sometimes involve the orbital structures and less frequently glioma, chondroma, and osteoma have been encountered in this region.

Sarcoma usually have their origin in the structures of the eyeball, most frequently in the sclera or subscleral structures; melono-sarcoma may develop in the choroid, membrana nictitans and eyelids. These tumors usually invade the structures of the eyeball so rapidly and extensively that the function is early impaired and usually becomes functionless in a short time.

Epithelioma so far as our observations have extended are the most common tumors of the orbital structures. These tumors not infrequently succeed an injury which may be produced by mechanical means, flies, dust or irritating chemicals. They usually begin at the junction of the conjunctiva with the

skin of the eyelid, however, some cases have been observed in which an epithelioma succeeded an ulcer of the corneal conjunctiva or of the corneal structures proper.

Corneal epithelioma are most frequently observed in cattle as a sequel of infectious conjunctivitis. Ocular or orbital epithelioma usually develops rather rapidly, and the corneal type usually extends into and invades the structure of the eyeball from the beginning, but the type that develops from the conjunctival-skin margin may not, even in the later stages, invade the eyeball. There is a tendency for these tumors to form a cauliflower-like, projecting mass which in some instances becomes as large as a cocoanut.

Carcinoma may develop in the retina or subretinal structures, or in the subconjunctival tissues. In general structure and disposition it is very similar to the epithelioma.

Endothelioma usually has its origin from vascular endothelium and occurs most frequently in the eyeball, originating in the choroid tissue. Papilloma generally originates in the eyelid margin, although it may develop from the conjunctiva. Each of these tumors has the same general appearance in the eye as in other locations.

Fibroma occurs most frequently in the deeper structures of the eyelids, and is practically identical to other fibromata.

The glimoa is relatively rare in the ocular structures of domestic animals, or at least, it is rarely diagnosed. It has its origin from the supporting structures of the optic nerve and retina.

The chondroma may have its origin from the cartilages of the eyelids or it may develop independently in the structure of the eyeball, particularly in the sclera.

The osteoma may have its origin in the bones forming the orbit or it may develop in the facial sinuses and extend into and encroach upon the structures of the orbit.

The following three cases illustrate two types of ocular tumors.

On February 21, 1913, an aged gray mare, affected with a tumor of the right eye, was presented at the clinic of the Kansas City Veterinary College. The history of this case showed that the development of the tumor had succeeded an injury which had been inflicted about two years previously by a snap on a line catching in the inner canthus of the eye.

On inspection, it was found that the tumor was an irregular nodular mass projecting from the orbit. The exposed part of

the tumor was covered with desiccated necrotic tissue. Manipulation showed the tumor had invaded and completely destroyed the eye. The animal was destroyed, but unfortunately no autopsy was obtained. Small pieces of the tumor were obtained and microscopical examination showed it to be an epithelioma.

Showing cauliflower projecting epithelioma, which completely destroyed the eye.

A diffuse epithelioma involving all structures of left orbital fossa.

The second case as shown by the accompanying illustration was a gray gelding in which the left eye was affected. No history could be obtained. The general appearance of the tumor was practically the same as the one above described. The animal was destroyed, and it was found that the tumor had invaded all the soft structures of the orbital cavity. Microscopically it was shown to be an epithelioma.

The third case was a cow whose owner had discovered a defect in her right eye. The defect consisted of a small tumorous growth apparently attached to the conjunctival mucous membrane. The gross appearance of the growth was that of a papilloma, and it was so diagnosed clinically. The growth was

carefully removed and laboratory examination confirmed the diagnosis of papilloma. The cow made an uneventful recovery.

The control and relief of tumors of the eye and adjacent structures by therapeutic agents has not been very successful. Oil of Thuja has in a few cases apparently been of some value. Proper surgical interference has been quite successful in the control of such tumors. In cases of malignant tumors, the operation must be done before the tumor becomes extensive and invades the surrounding tissues or becomes metastasized. Relief from sarcoma is usually accomplished only by enucleation because of the fact that these tumors have their origin in the structures of the eyeball. Corneal epithelioma and carcinoma require the same form of operation. Epithelioma of the eyelids in the early stages can frequently be ablated without serious damage to the structures of the eyeball, and in some instances great cauliflower masses that projected and covered the surfaces of the eyes have been successfully removed without impairing the power of vision.

Benign tumors that invade the deeper and intricate structures of the eyeball can usually be removed only by enucleation. External benign tumors of the eye usually respond to operative procedures which are effective in the treatment of benign tumors in any other location. Occasionally, interference with an ocular benign tumor is followed by the development of a malignant tumor.

CASES FROM MY NOTE BOOK.

By W. F. Hayes, D.V.M., Farmersville, Texas.

Case 1.—*Cæsarian section in ewe.*—Two-year-old Cotswool, well developed, in good flesh, had been in labor since early morning, was called out in the afternoon, arrived at 2 p. m. Examination revealed os uteri just slightly dilated, labor pains very mild. Catherized bladder and further dilated os which was very resistant. Ruptured fœtal membranes which disclosed posterior breech presentation, dorso-sacral position. Not being able to insert hand through os was not able after three or four hours' work to successfully repel or change position of fœtus. Decided on operation. After observing usual technique of preparing field made eight or nine-inch vertical incision in right flank begin-

ning just anterior to spine of ilium, arrested hemorrhage, lifted gravid uterus through incision in flank, incised uterus on inferior surface, extracted dead fœtus (only one) and fœtal membranes. Rinsed peritoneal cavity with normal saline solution. Sutured incision with Irish linen (not having silk or gut). Animal offered very little resistance during operation. No anesthetic was given on account of being in the country and not having any with me at the time. Immediately after removing restraint the animal drank water and began eating hay. Fifteen days after she has apparently made nice recovery.

Case No. 2.—Death in cow from Urticara, or Nettle Rash.—A two-year-old good grade Jersey, her calf six weeks old, has been in pasture in the country till after calving; was then brought into town, small lot, not much exercise, owner very careful and painstaking. Gradually increased feed, is now getting coarse bran with shorts, cotton seed and prairie hay all she will eat; some corn, two or three pints of cotton seed meal daily with this. Quality of feed is excellent. She is also grazed one or two hours daily on orchard grass. Cow is gaining rapidly in quantity and quality of milk. She seems in pink of condition. After being milked in morning owner notices her restless, rubbing and licking herself, pretty soon a pomphous eruption is noticed over body. I was called and found the usual symptoms present. Eyes swollen, some lachrymation, the plaques or small areas of circumscribed œdema especially marked on parts where skin is thin, about muzzle, anus, udder and between thighs. We found respiration somewhat increased, slight dyspnœa, circulation not much disturbed, temperature normal, ears drooped, general depressed appearance, but some inclination to eat; no tympanites, yet rumen feels impacted. This is about one and one-half hours after first being noticed. We diagnosed case urticaria caused from toxins absorbed from digestive disturbance. Administered a saline purge, bathed body in tepid acetic water to allay the exanthema. We assured owner of a very favorable prognosis within twelve to thirty-six hours. In less than two hours we are informed our patient is dead. Autopsied five hours after death. We found stomachs overloaded. Abomasum shows some small areas of inflammation in mucosa. Also small portion of jejunum and ileum. Spleen and lymphatics in general normal, did not observe anything further of interest until reaching the region of the larynx and epiglottis. Here around the epiglottis inside the pharyngeal region along sides of tongue the mucosa was very much thickened. The characteristic pomphi were very

much in evidence, the exudate was of a yellowish or straw color and of gelatinous consistency. This animal died with œdema of the glottis caused from the urticaria beyond a doubt in my opinion. Isn't this a very unusual termination, or what was it?

A FRACTURED VERTEBRA.

By J. A. De Groodt, House Surgeon, New York-American Veterinary College.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

On Saturday, March 1st, Dean Coates took a group of the students of the "New York-American Veterinary College" to see a case in Hoboken, N. J., to which he had been called in consultation.

The subject, a chestnut gelding, had on the Tuesday preceding, ran away and received an injury, the result of running against a pole, which caused him to be thrown to the ground.

Upon the capture of the animal, he was returned to the stable, a distance of about two and one-half miles, in, as far as could be seen, a normal condition.

On Thursday there appeared in the lower portion of the neck and upon both sides an area of profuse sweating of about eighteen inches in diameter; while the rest of the body was perfectly dry.

Aside from this fact the animal acted perfectly normal until Saturday morning; when it was found that he had lain down during the night for the first time since the accident; and was unable to regain his feet. Had a sub-normal temperature, weakened and irregular pulse, and labored respirations.

Upon further examination by Dean Coates, it was found that the animal was practically unaware of the prick of the pin or a sharp pointed bistoury, except above the lower portion of the neck.

The Dean then made a diagnosis of a fractured vertebra; basing it upon the paralysis of the body. He restricted the fracture to the last cervical or the first dorsals for the reason that the animal broke out in a sweat in that region.

His reason for restricting his diagnosis was based upon the fact, that, when animals were injected with cocaine in cases of suspected shoulder and hip lameness there generally appeared, after a short period of time, around the point of injection a sweated area of a variable diameter.

The subject was removed to the Hospital of the New

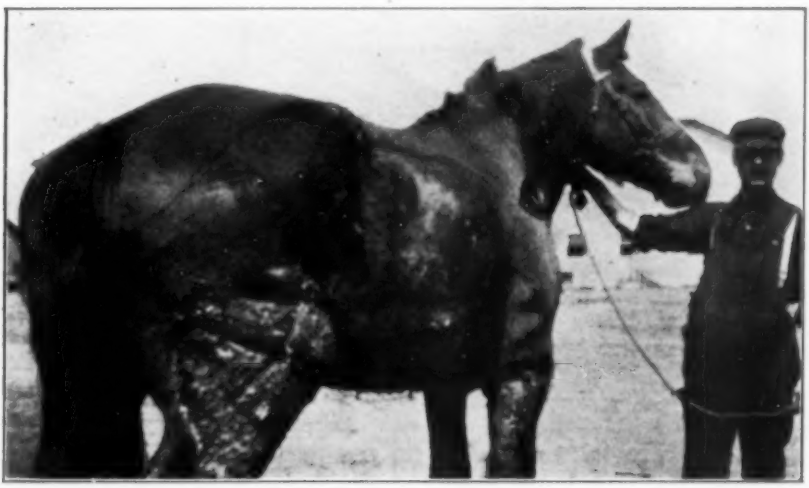
York-American Veterinary College, where he died the Sunday following.

Upon post-mortem it was found that the sixth cervical vertebra, known as the tricuspid, was fractured. The articular cavity upon the posterior extremity of the posterior portion, together with the posterior transverse process of the same, was fractured in seventeen pieces. The capsular ligaments of the articular facets of the body of the bone were completely lacerated and stained with blood from the bruised muscular tissue of this region.

The peculiar fact of this interesting case was that the animal had walked to the stable and did not show symptoms of a fractured vertebra until the fourth day after the accident occurred. This can be explained by the fact that the fractured pieces remained intact until the animal reclined and were separated or dislocated by his repeated attempts to regain his feet. These dislocated pieces then pressed upon the spinal cord causing the paralysis of it posterior to this portion.

A SEVERE BURNING WITH HOT CINDERS.

By H. W. Skerritt, V.S., Utica, N. Y.



Two and one-half weeks, prior to this writing, a horse fell on a heap of red hot cinders at New York Mills, N. Y. You will see by photo that horse was roasted (so to speak) all over

his side, thigh, neck and arm; also under part of abdomen. I was called to treat him when first injured and found him in an awful condition—as above. The skin being in a corrugated condition, due to the roasting he had received; being cast on the cinder dump for a few minutes. Carron oil was first applied with soothing effect; also fever medicine given. I called to see the case the next day, and found swellings 6 inches deep by many feet wide, yellow serum oozing from side and lower part of abdomen. I had practiced 30 years, but this was the most horrible sight I had ever seen. The New York Mills Co., who owned the horse, were very anxious to save him if possible, so I injected Poly Bacterins (Abbott) *every day* for a few days, and applied a mixture composed of olive oil, two gallons iodine ℥ii., belladonna qt., applied with swab of cotton waste; being careful not to rub the parts, but simply "sop" it on. In a few days the skin cleaved from the flesh, in 10 days he began to eat fairly well, also the sores healing rapidly. The photo was taken 18 days after the burning, and shows the horse to have taken on flesh; also the upper part of body and hip have started a crop of hair. The arm and the thigh has healed nicely for so short a time; in fact, I never saw sores of this kind to heal so fast as in this case. We are now waiting to see if a complete covering of hair will hide the awful raw patches of granulating tissue; if so I will report.

PAROTITIS IN HOGS AND DOGS.

By F. H. Benjamin, D.V.M., North East, Md.

Subjects.—Three hogs (weight about 75 pounds each), and two young dogs, a mastiff and a small mongrel.

History.—Owner stated he had three shoats; two contracted the disease at about the same time, and in a few days the other one became affected. This was during a very wet period in January, last, and all were continually wet and chilled. When I was called two of the hogs were already dead, and the third died before I arrived.

These were the only hogs on the premises. The two dogs had been running loose with the hogs and probably contracted the disease in this way.

Symptoms.—Both dogs were affected alike, showing a large swelling of the parotid and submaxillary glands, dullness, ina-

bility to masticate food, no appetite and a slight sneezing. I only saw the carcass of one of the hogs, and this showed similar glandular swelling.

Treatment.—The dogs were not allowed to get wet and camphorated oil was applied locally to the swollen glands. Both recovered.

Having read of cases of Parotitis contracted from "mumps" in man I inquired if anyone around there had been so affected, but received a negative answer. There was no evident cause for the malady and no other cases appeared in the neighborhood. No other hogs or dogs on the premises.

A DOUBLE HEADED CALF.

By A. E. LAMBERT, V.S., New Windsor, Md.

The accompanying illustration represents the double head of a calf that it was my good fortune to meet in my practice. The heads are in a straight line, and form a perfect right angle to the neck. They are perfect in every respect, as is the body, and

were attached to the neck directly behind the ears, shown in the front of the picture. To me it is a great curiosity, and I believe it will interest my brothers in the profession to whom I present it through the AMERICAN VETERINARY REVIEW, to

which valuable paper I have been a subscribed for many, many years.

INJURY TO FETLOCK WITH PURULENT INFECTION —AUTOTHERAPY.

By Jay MacDonald, V.S., New York, N. Y.

Vanderbilt coaching horse from London. Chestnut gelding, 9 years old, 15 hands high, very shy, became frightened at auto and cut fetlock wide open. Severe purulent infection set in. The inguinal glands became involved. The leg was enormously swollen, high temperature. This case appeared to be hopeless, and would under other conditions have been destroyed.

Treatment.—Twenty cubic centimeters of pus were placed in a quart of water and thoroughly shaken; of this two ounces were given every two hours for twelve hours. In twenty-four hours the horse was better in every way. He had but one other treatment, and in three weeks was well. I have used this treatment in several other cases just as severe with equally good results, and am convinced that nothing else could have saved these animals.

FISTULOUS WITHERS—AUTOTHERAPY.

By R. S. MacKeller, V.S., New York, N. Y.

I judge this case would not recover in less than three months, and to do this it would in all probability have to be operated. The pus was thick, copious and yellow.

An ounce of pus was placed in six ounces of water and thoroughly shaken. Of this he was given one ounce by the mouth every hour for four doses. In forty-eight hours the discharge was less. It was thinner and streaked with blood. In ten days' time the wound was nearly closed, there was little exudate. In order to obtain sufficient discharge I made a slight curettage from the side of the wound using the crust or scab. This was also mixed with four ounces of water and well shaken. Of this I gave four more doses in the manner described above. In ten more days the wound had healed. The horse was then put to work, the collar rubbed again, and it broke down. One more dose was given and that was the last of it.

SYNOVITIS OF THE CORONARY JOINT—AUTOTHERAPY.

BY THE SAME.

In a very severe case of synovitis of the coronary joint I gave the same treatment as in the preceding case, and in three weeks the horse was well. The pus was markedly less in forty-eight hours, it then became thin and streaked with blood and gradually stopped. I have treated many other similar cases in this manner, and am using autotherapy in my practice where I am able, to the exclusion of all other medication.

MASSACHUSETTS BOARD OF REGISTRATION IN VETERINARY MEDICINE MEETS THIS MONTH.—The summer examination for registration in veterinary medicine in the Commonwealth of Massachusetts will be held at the State House, Boston, on June 25th and 26th, for which application blanks are obtainable of the Secretary, E. W. Babson, Gloucester, Mass. Such application blanks must be properly filled out, acknowledged before a Justice, accompanied by the fee of $15, and filed with the Secretary at least three (3) days before the examination.

DR. DALRYMPLE RESPONDS FOR THE VETERINARY PROFESSION.—At the 34th annual meeting of the Louisiana State Medical Society, held in Baton Rouge, La., April 22 to 24, Dr. Fred. J. Mayer, of Opelousas, La., was elected president.

Dr. Mayer may be remembered by the excellent paper he presented on "The Important Relation of the Veterinarian to Public Health" at the 45th annual meeting of the American Veterinary Medical Association at Philadelphia, in 1908.

At the annual banquet Dr. W. H. Dalrymple, Louisiana State University, who has been an honorary member of the State Medical Society for the past eleven years, responded to the toast, "The Veterinary Profession." There was a large attendance at the banquet, including the Governor of the State, Hon. Luther E. Hall, who was on the toast list, as well as the most prominent members of the medical profession in Louisiana. That is the sort of company we are accustomed to finding our friend Dalrymple in, and always seeing to it that the veterinary profession's end is held up.

ABSTRACTS FROM EXCHANGES.

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

ANEURISM OF BRANCH OF OCCIPITAL ARTERY RUPTURED IN GUTTURAL POUCH OF A MARE—DEATH FOLLOWS REPEATED HEMORRHAGES [*Dr. Fairise and Mr. A. Barbier*].—A four-year-old mare bleeds profusely from the nose; the hemorrhage stops by itself. Examination of the animal shows the nostrils soiled with blood; there is no apparent lesion of the anterior portion of the nasal cavities. The sinuses of the face sound natural on percussion. By auscultation there is light diminution of the respiratory sounds. Pulse accelerated, regular and no hypertension. There is tachycardy. Conjunctives are rather pale. It is calculated that the mare has lost about six litres of blood. No conclusion arrived at as to diagnosis, and ergotine is prescribed. Two days after, new hemorrhage that plugging of the nose with oxygenated water, iced aspersions on head, nor ergotine can stop. After losing about three litres of blood the flow is arrested. Injections of gelatine serum are prescribed—and made for several days in succession—4 litres, 3 and later one litre. One more hemorrhage is arrested with ergotine. The animal appears at last in a better condition. One morning, twenty days after the first hemorrhage, the mare is found dead, with the floor of her stall full of blood. At the post mortem, nothing abnormal was found, except that the organs are pale and empty of blood, few clots are found in the nasal fossa, the pharynx and the right guttural pouch, which present also near the base of the cranium a small tumor. The left pouch is normal. This tumor is situated in a fold of the mucous; it is of dark red color and contains a clot of blood, with various stages of organization. It is a small aneurism of a branch of the occipital, which has burst and given rise to the repeated fatal hemorrhages.—(*Rev. Gen. de Med. Vet.*)

VAGINAL STEATOMA IN COWS [*D. Bonnigal*].—A cow has calved with difficulty and after removal of the placenta shows

at the vulva opening a mass as big as an egg, hard and greyish looking, like the fat which lays round the kidneys. The mass extends in as far as the middle of the right side of the vagina and is adhering to a piece of torn mucous membrane. Nothing is thought of it and after a few days of antiseptic injections all the trouble has subsided.

Another cow presented a similar red tumor protruding through the vulva when the animal is lying down. It is as big as an apple, attached with a peduncle and is covered with the mucous membrane. Strong cord ligature is applied, and a few days after the growth is excised.

A third cow after calving presented the same condition. The tumor, as big as the two fists, is visible only when the cow lies down. It is also removed after four days, having been ligated with a strong cord tied on its base.

The two last tumors examined were steatoma and probably the first was also.—(*Presse Veter.*)

Milch Cow Attacked by Swarm of Bees [*A. Eloire*].—Grazing, attached to a picket in the ground, a Hollandish cow, black pie in color, is attacked by swarm of bees, which attach themselves only on the black portion of her skin, the head, neck and part of the shoulder. It was with great difficulty that the insects were chased away, leaving the cow immobile, shivering all over, the eyes closed with swelling of the eyelids, the ears drooping and swollen. The black parts where the bees stung the cow are covered with greyish powder, which is made up of stings left by the bees. On the surface of the black designs there are thousands of raised pimples, and on some parts of the skin the surface is swollen and rough to the touch. The respiration of the animal is not much disturbed; the temperature a little below normal. Then there appeared thick swelling of the eyes and of the intermaxillary space. Serosity is oozing here and there on some places. The lactation gradually dropped to one litre of milk a day. On the third day the condition seemed less severe; the swelling of the head has gradually dropped to the chest; attempts to ruminate are taking place; mastication however remains difficult. The skin has burst in some places at the base of the ears, and on the lateral faces of the neck there has been some sloughs taking place. One is principally wide on the right shoulder. Gradually the milk has returned, but it is only after twenty-four days that full convalescence is established. The treatment consisted in frequent lotion of weak liq. amm. (10 per

cent.), light laxative, salicylic acid, warm lotions on œdematous swelling.—(*Bullet. Soc. Cent.*)

FATAL WOUND OF THE HEART [*MM. Ducher and Sejournant, Army Veterinarians*].—Thirteen-year-old horse is found dead in his stable one morning. The body presents no mark of traumatism. At the autopsy was found, visible mucus are pale, back of left elbow a large subcutaneous ecchymosis. Abdomen contains blood, not coagulated; no lesion except a tumor grafted on the left suprarenal capsula. Opening of the thorax shows great quantity of unclotted blood; lungs healthy. On the left costal wall, on a level with the heart, big ecchymosis, in the center of which appear the ends of the fifth rib fractured, about the limit of the inferior and middle third. Splints of bones are in the intercostal. The heart shows a wound of the ventricle and the left branch of the coronary artery is ruptured in the middle of its diameter. These wounds were produced by the ends of the fractured rib.—(*Ibid.*)

SUDDEN DEATH BY SPONTANEOUS POST-OPERATORY RUPTURE OF THE EXTERNAL PUDIC ARTERY IN A HORSE [*Professors C. Petit and R. Germain and Hannequin, Student*].—*History:* Old, entire heavy draught horse has had since a long time a chronic inguinal hernia, double, very large and easily reducible. He is operated. The operation is done on one side only, according to classical method; separation of the sac by dilaceration with the hand of the surrounding connective tissue, return of the hernia in the abdomen, torsion of the sheath, application of a curved clamp, section of the cord below it—ordinary after care. Everything seems to go normally, when suddenly one morning, twenty days after the operation, an abundant hemorrhage takes place and the animal dies. The autopsy revealed no other lesion but hemorrhage was the cause of death; viz., the external pudic artery, which had given way a little below its origin from the posterior abdominal artery.—(*Ibid.*)

LARGE ADHERING COECAL HERNIA IN A MULE—OPERATION—RADICAL RECOVERY [*L. Auger*].—Four-year-old mule has on the lower third of the right flank a tumor as big as a child's head. It is soft, reducible, and the hernial ring is readily felt, measuring 10 to 12 centimeters in diameter. The diagnosis is certain, ventral hernia, which requires to be operated. The animal cast, secured, prepared and placed in position, two curved incisions

joining at their extremities and embracing an elliptic piece of skin were made and the cutaneous portion dissected out. Then the dissection of the sac, as far as the hernial ring, was made, separating it from the skin that covered it. The walls of the sac seemed to be quite thick and before isolating it from the ring, so as to return it easily in the abdomen, an incision was made through its walls, when it was found that it formed a big pouch containing food substances and was made with the point of the coecum, which had protruded into the sac and become adherent to it. The intestine was carefully isolated with the fingers and the aid of the forceps, and the incision that had opened it closed with two rows of sutures. Then the hernial sac was isolated, returned in the abdomen and the closing of the opening of the abdominal walls was closed with the Legive's method, adding to it the use of Marlot's nippers. There was no event of any nature in the convalescence of the mule, except a cutaneous wound which demanded a month for its complete healing.—(*Journ. de Zootech.*)

Ovarian Cyst Caused Death by Intestinal Obstruction [*Mr. Lethard*].—Fifteen-year-old Percheron mare has bad colics; she has eaten well and besides her ration has taken part of that of her stall neighbor. The colics are intermittent. Indigestion is diagnosed and proper treatment applied. In the later part of the day she grows bad. Tympanitis sets in, and expulsive strains take place. Rectal examination is arrested by a narrow obstruction, which prevents further exploration. After forty-eight hours of suffering the mare dies. At the post mortem there was found an ovarian cyst of the right side, forming an enormous tumor, as big as a man's head and weighing 5 kilogs. 125 grams. It was hanging to the border of the broad ligament and free to such extent that it pressed against the terminal portion of the floating colon and the anterior border of the pubic symphisis, completely obstructing the lumen of the intestine. The left ovary was hypertrophied.—(*Bullet. de la Soc. Cent.*)

ENGLISH REVIEW.

By Prof. A. Liautard, M.D., V.M.

Complicated and Rare Fracture [*Capt. H. Allen, A.V.C.*].—Five-year-old gelding slipped whilst turning a corner. Seen the day after the accident he presented as symptoms—con-

siderable synovial effusion on the near knee, which extended about five inches above and below the joint. The knee was displaced inwards. There was crepitation and pain on digital manipulations of the external surface of the knee. No abrasion whatever of the skin. The animal showed no sign of distress or pain. Destroyed—the knee examined showed—a fracture of the os magnum, the lunar and the scaphoid. Comminuted fracture of the cuniform, fracture without displacement of the internal portion of the head of the external small metacarpal bone.—(*Vet. Record.*)

Pleuritic Effusion [*R. Ferguson Stirling, F.R.C.V.S. & Lt., A.V.C.*].—The case of a six-year-old Artillery draught gelding which presented symptoms of pulmonary trouble for which counter irritation with mustard on both sides of the chest and Salicyl. Sodæ and Carbon. Ammon. were prescribed. On the seventh day following the attack, suspecting fluid in the chest, tapping was performed with no results. The temperature had varied between 105°.2F. and 102°8—when on the eleventh day it rose to 104°, the pulse was 72 weak and thready, the respiration 60, distressed. Fluid was then detected and another tapping gave escape to nerly 53 pints of fluid. Improvement followed, after this, appetite returned and convalescence set in. The animal was sick twenty days.—(*Vet. Record.*)

Ovariotomy and Aneurism of Posterior Aorta [*A. R. Routledge, F.R.C.V.S.*].—Concise record of a fatal case of great value in the practical point of view. Aged mare, always in œstrum, is cast and chloroformed to have her ovaries removed. As the incision through the vagina is made, a rush of blood follows, and the mare dies within five minutes by hemorrhage. Aneurism of the posterior aorta was found at the autopsy, the size of a child's head it had been punctured by the knife.

The result shows the morale of conducting a thorough examination before operating.—(*Vet. Journal.*)

Three Cryptorchid [*Prof. F. Hobday, F.R.C.V.S.*].—1. In one colt, 3 years old, the left testicle being in the scrotum, the right was in the abdomen. This weighed one pound nine ounces. It was very interesting, being an embryoma contained in a cyst and replacing the paradidymis. The solid bone—encapsuled body contained in the cyst was made of embryonic tissue containing glands, bones and cartilage.

2. The second one operated was 13 months old. The right

testicle was in the abdomen and weighed 2½ pounds. It was a cystic testicle which was too large to be extracted and had to be emptied of its contents.

3. The third subject was a two-year-old colt, whose right testicle was in the abdomen and weighed one and a half pounds. It was also revealed as an embryoma, as it contained the mixed elements of such.

The three horses made a good recovery, the operation being made under chloroform and disinfection realized with tinct. of iodine only.—(*Ibid.*)

PROSTATITIS WITH UNUSUAL CYST IN A DOG COMPLICATED WITH NEPHRITIS [*Prof. Geo. H. Woodridge, F.R.C.V.S.*].—Retriever collie is in thin condition and walks with unsteady gait, reeling side ways as a drunken man. His mucous membranes are pale, the pulse weak, temperature per rectum 100°5. A tense body is felt in the abdomen, in front of the pubis and pressure is followed by escape of a few drops of turbid urine. Rectum was empty, and no sign of prostate could be felt within the pelvis. Catheterism of the bladder failed to draw any urine. Laparotomy was suggested and performed under morphia. A little ascitic fluid escaped when the abdomen was opened—a large body was then exposed with the urinary bladder attached to it, and the prostate about the size of a man's fist. In front of it and lying directly above the bladder was a thick walled cyst, as large as a donkey's testicle, which to be emptied had to be opened with an incision, giving escape to about half a pint of thick, greenish, flocculent material. The prostate was densely adherent to the urethra and neck of the bladder, and could not be operated. The wound was closed, the dog put under stimulants, but died about twelve hours later. Post-mortem revealed that both kidneys were affected with interstitial nephritis. The bladder contained but little urine. The prostate was as large as a big orange and very dense. The nature and origin of the cyst remains undiscovered. There were no communications between it and the prostate or the urethra.—(*Vet. Journal.*)

TAENIA SERRATA IN DOGS [*E. D. Young*].—Irish terrier has tapeworms. He gets a purgative, then for a few days is kept on fluid diet and subsequently receives tenaline m. i. to each pound of the body weight. After twenty minutes he passed a sufficiently quantity of tapeworm to fill a pudding bowl. There

were 80 parasites of an average length of 18 inches, forming a total length of 123 feet 6 inches.—*Vet. Record.*)

USES OF ARECOLINE [*Capt. E. P. Argyle, A.V.C.*].—OEDEMA.—Aged gelding has on one or two occasions seemed to be fatigued early in the day. While jumping a fence, he had a fall and was laid up for some time. Some three months later he has a large œdematous swelling under the abdomen, from the xyphoid cartilage to the pubis. This appeared a few days after his last accident. The case was diagnosed arcitis, sound of moving liquid being detected in auscultation of the abdomen. General condition good—no fever—pulse weak and slow—beats of the heart irregular. Treatment consists in digitalis, and as no change appeared it was decided to try arecoline. A grain was started with and continued until he had 5 grains after a week. With the effects of the drug the abdomen began to reduce. One grain was then given every three days for a fortnight with reduction in the swelling. The animal was turned out and lost sight of.—(*Vet. Record.*)

STATE VETERINARIAN WHITE OF TENNESSEE WARNS FARMERS AGAINST ADVERTISED "HOG CHOLERA CURES."—In a little paper called *Tennessee Agriculture*, Dr. Geo. R. White, State Veterinarian, explains the Dorset-Niles Anti-Hog-Cholera Serum to the farmers of his state, and warns them against fraudulent preparations. The last two paragraphs of the article read as follows: "At the present time this state is being flooded with advertisements—by mail and otherwise—of at least thirty commercial firms who have something 'attractive'—in price or otherwise—to offer the swine owners for the treatment and prevention of hog cholera. Beware of these and remember that all medicines advertised as 'hog cholera cures' are worthless and that 50 per cent. of the 'serums' and 'vaccines' are 'frauds' and are sold and distributed in this state in open violation of law.

"We are arranging for submitting all the commercial serums now offered for sale in Tennessee to rigid tests to determine their efficiency. As soon as these tests are completed the department will expose all 'fakirs' by publishing their names in *Tennessee Agriculture* and other agricultural papers of the state."

CORRESPONDENCE.

GOSHEN, N. Y., May 5, 1913.

Editor AMERICAN VETERINARY REVIEW, *New York, N. Y.:*

I fear that your readers will think that I am going about with a chip on my shoulder, looking for a scrap with some one or any one; however, even at the risk of being considered a crank, I wish to take issue with some statements made by Dr. T. B. Rogers in his excellent paper entitled "Certain Phases of Operative Surgery," appearing in the May number of your journal.

First let me assure you of my great respect for Dr. Rogers's ability and integrity, also his age and experience.

Referring to castration, Dr. Rogers says: "Castrating a horse standing is a good deal like making a flying drill on the railroad; if all goes well, we save a little time; if it doesn't, well, something happens." I wonder what Dr. Rogers means when he says, "if all goes well"; what is there to go wrong any more than when the animal is cast for the operation? In my judgment there is not one-tenth as much that may go wrong *or does go wrong* as when the animal is cast.

There are many arguments in favor of standing castration aside from saving time, which in itself is no small item during the busy season. I think it is safe to say that I can leisurely castrate four colts standing, while Dr. Rogers or any other man castrates one down, and do it with less help, without worrying and straining every one who assists and the colt as well—but Dr. Rogers is discussing the advance of veterinary surgery, so let us stick to that point.

I can furnish Dr. Rogers with the names of owners and the locations where I have castrated, to be conservative, say 750 horses during the past 15 years, and at least 90 per cent. of these have been done standing; in fact, other than cryptorchids or those with scrotal hernia I always operate standing, excepting in rare

cases, where the owner is old-fashioned enough to wish the animal cast; and I have yet my first accident in any form or manner to record against the standing operation.

As against this I recall having some six or seven years ago a prolapsed intestine in a four-year-old that I castrated in the recumbent position. I examined this horse for scrotal hernia with the same caution that I do all cases before operating, and I shall always feel that the strain attendant upon casting and confinement caused the necessary injury to the inguinal canal to permit the hernia; in other words, had this horse been operated upon standing, the hernia never would have occurred.

Again I can furnish you with the names of half a dozen castrators in our county who do an occasional castration, casting each case, and ridicule the standing operation (I say an occasional castration advisedly, since but few will have a colt cast for the operation after once witnessing it properly done standing), all of which have recorded against them accidents of various sorts, ranging from broken backs, broken legs and strained tendons to an occasional case of tetanus and pyemia due to infected earth and filth falling into the wound when the colt is on his back struggling.

My friend will argue that if the colt's legs, feet, etc., were properly washed with a reliable disinfectant, the latter could be avoided. Well, I will agree with him, but would add that if the inguinal region is properly disinfected and the sides of the animal dampened, assuming that the place of operation is reasonably satisfactory and the operator and his instruments as clean as they should be, as aseptic an operation can be performed in the standing position as could be performed in the Vanderbilt clinic with the colt on its back after first subjecting it to an antiseptic bath.

In conclusion let me say, a colt that is properly castrated standing has suffered no excitement, no strain and practically no shock; swells but little, if any; in fact, as the horsemen say, "he never knows when he was cut." Therefore, the only plausible excuse for preferring the cast position is the lack of courage of the operator *to get up close to, and keep up close to,* his horse when operating, or because he has not operated often enough standing to become an adept.

Operating standing may be a little harder on the man, but it is surely easier on the horse. I solicit the opinion of others on this subject.

Yours truly,

J. F. De Vine.

COTTONWOOD, MINN., May 19, 1913.

AMERICAN VETERINARY REVIEW, New York:

I wish to learn from an experienced veterinarian the care and feeding of an orphan colt. What amount of water must be added to the cow's milk, and sugar to make up a balanced ration for the little, motherless creature? *Anxious to learn.* I have followed directions of some author and made a poor show.

Respectfully,

S. J. ALCALAY.

NOTE.—There are any number of veterinarians, we are sure, who are in a position to give our good friend, Dr. Alcalay, the information he asks, and we trust that they will not hesitate to do so. Of course, theoretically it is a comparatively easy matter to balance the properties in a cow's milk so as to make it apply as a ration for a colt. The principal properties at variance being the sugar, the butter fats and the casein, the last being the most detrimental property in the cow's milk when fed to a colt from its tendency to constipate. We had an experience in raising a colt on cow's milk that may be of some interest both to our correspondent and to those of his brothers who will reply to his inquiry from their wider experience. We started to raise an orphan filly on cow's milk by balancing the sugar portion of it to that found in mare's milk, and to overcome the casein by the use of wheat bran and ground flaxseed. The latter were not mixed in the milk, but wheat bran was spread lightly over a flat smooth board surface at convenient height to the colt and she readily "licked" it up and seemed to relish it, with the effect that it appeared to regulate the bowels, it scarcely ever being necessary to add the ground flaxseed. But before going any further, we want to explain that our efforts at furnishing the balanced ration milk got no further than its preparation, as our adopted child positively refused to partake of it. After about thirty-six hours of fasting, however, she suddenly thrust her nose into a supply of milk that had been that minute drawn from a cow and never took it out until she had finished it. From that time on she had warm milk from the cow with no attempt at "balancing," and there never was a suggestion of digestive derangement at any time. She occupied a box stall next to a cow's stall, through the side of which a little door was cut entering directly on to the little platform from which she licked her dry bran, and the milker, without rising from his stool, would swing round, raise the little door, and place the pail containing the warm frothing milk direct from the cow under the filly's nose. That she enjoyed it was made evident from the fact that she soon learned the "old familiar sound" of milk dashing into a pail, and during the milking of the cow would paw the side of the stall and neigh anxiously and by the relish with which she would consume it. She grew into a fine young mare, and when two years old regarded a pail of cow's milk as a special treat, and would drink it with evident relish.—[EDITOR.]

OTTAWA, CANADA, May 9, 1913.

Editor AMERICAN VETERINARY REVIEW, *New York:*

Dr. S. Hadwen, of our Department, has recently made a discovery of some interest in connection with paralysis of lambs.

Some of the sheep owners in British Columbia have had

losses from time to time of sheep, and especially of lambs showing symptoms of paralysis. In investigating these cases Dr. Hadwen has found the affected sheep were in nearly every case carrying ticks, which seemed to be distributed chiefly along the spinal region. These ticks he identified as Dermacentor Venutus (Banks). Thinking that these ticks might have some relation to the cause of the disease, he procured a number of them and made an experiment by causing them to attach themselves along the spine of a healthy lamb. Four days later the lamb appeared to be unwell, and on the sixth day the lamb was getting weak and showed signs of lack of co-ordination. On the seventh day there was a total loss of co-ordination, which progressed until on the tenth day the lamb was paralyzed.

The lamb was then killed, and on examination the only parts visibly affected were the nervous system; the covering of the brain and cord were distinctly injected, and an exudate was found in the ventricles.

Further experiments are being conducted, but I have deemed the matter of sufficient importance to bring it to your notice at this time.

With kind regards,

Yours sincerely,

F. TORRANCE,
Veterinary Director-General.

SAN FRANCISCO VETERINARY COLLEGE CONFERS DEGREE OF DOCTOR OF VETERINARY MEDICINE ON TWENTY-NINE CANDIDATES.—The commencement exercises of the San Francisco Veterinary College were held in Maple Hall, Saturday evening, April 12, 1913. The degree of doctor of veterinary medicine was conferred upon twenty-nine gentlemen, representing seven states and two foreign countries.

MISSOURI VETERINARY MEDICAL ASSOCIATION.—On July 30 and 31 the annual meeting of the Missouri Veterinary Medical Association will be held at Kirksville, Mo. Arrangements are being made by Dr. W. E. Neil, of Kirksville, to offer an attractive two-day program, including a large clinic. Following the successful meeting at Marshall last year and the interest created by the decision of the assembly to print its proceedings, a large attendance is expected at Kirksville.

OBITUARY.

JOSEPH BRADY KINTER, V.S.

Dr. Joseph B. Kinter died on March 30, 1913, of incipient paresis. Dr. Kinter was born at Marion Center, Pa., in August, 1870. Being the son of John Andrew and Adelaide (Brady) Kinter. He was educated at the public schools of that place, and, when old enough, entered the Ontario Veterinary College, from which institution he graduated in 1891, when he began the practice of his profession at Danville, Indiana; and at the outbreak of the Spanish-American War he joined the Twenty-seventh Indiana Volunteers as Battery Veterinarian. Dr. Kinter was married December 24, 1889, to Anna B. Linton, who, with an eleven-year-old son, survives him. In August, 1906, the doctor entered the B. A. I. service and continued in that work until he became afflicted with the malady that caused his death, in November, 1912.

Dr. Kinter was an active worker for the uplift of the veterinary profession in Indiana, and, in the words of Dr. A. F. Nelson, secretary of the Indiana Veterinary Medical Association, who at one time was associated with him in practice, and who furnished the data for this notice, "he was a pleasant, enthusiastic and brainy veterinarian; and I am sure that as secretary of the Indiana Veterinary Medical Association, I voice the sentiment of all when I say, in the language of old, 'A good man has fallen'; and in behalf of this association I extend our sympathy to his widow and son."

JOHN B. COSGROVE, V.S.

Dr. John B. Cosgrove died in March, 1913, at the home of his sister, Mrs. John M. Power, as the result of an attack of

arterio sclerosis. Dr. Cosgrove was born in Rutland, Mass., in 1843, his parents having been Francis and Ann (Dormer) Cosgrove, of that place. The doctor had reached his three score years and ten unmarried; having always lived at the old homestead, No. 9 Brown street, Worcester, until the death of his maiden sister in July last; after which he made his home with Mrs. Power.

Dr. Cosgrove graduated from the New York College of Veterinary Surgeons in 1876, and was the first graduate in veterinary surgery to practice his profession in Worcester. He was highly esteemed by his townspeople and by the veterinary profession in New England.

He is survived by a brother, Mr. Mark F. Cosgrove, and a sister, Mrs. John M. Power.

Dr. John G. Slee, graduate of the American Veterinary College (1897), died in Portland, Oregon, March 3, 1913. Obituary will appear in next issue.

Resurgam.

With heartfelt sympathy for the bereaved, we announce the death of Mrs. Wilson Huff, of Rome, N. Y., on May 6, 1913, in her seventieth year. Mrs. Huff, who was a Canadian by birth, came to Rome as a bride 46 years ago, where she and her good husband have lived ever since, enjoying good health until three years ago, since which time her health has been poor. The direct cause of death was hæmorrhage of the brain, suffered five days previously. The sympathy of the entire veterinary profession is extended to the bereaved husband and daughters who survive her.

ARMY VETERINARY DEPARTMENT.

THE NEW CONGRESS WILL HANDLE THE ARMY VETERINARY SERVICE BILL DIFFERENTLY.

"Lopping ears tell of indifference; pricked-up ears mean alertness," saith the veterinarian.

There is no worse abomination than to think that, because the Army Veterinary Service Bill failed of passage in the Congress which closed in March, the topic of army veterinary legislation is, as Scrooge said of Marley in Dickens' Christmas story, "dead as a door nail." There is no topic more alive in the militant veterinary profession of America to-day than that of our obligation to rectify the false position in which, in this day of grace, the veterinarian is placed in the army. It is true the bill failed of passage, but its soul, as the Civil War soldiers sang of John Brown, "goes marching on." We, whose business it is to be observers of animals, know that lopping ears tell of indifference to what is going on, and that pricked-up ears mean that there is present alertness and attentiveness to the spoken word. Is it possible to believe that this problem of army veterinary legislation will fall upon dull ears, will fail to attract attention until it is solved? Better it were far that we wrote ourselves down as men of pigmy minds, "infirm of purpose," untouched with the fire which makes souls great, than that we permit such a thing. This subject cannot, must not be allowed to pall upon us. It is a subject which will not down. What is a month, or a year, when a right is to be won? Are men to point the finger of scorn at us as weaklings and cowards that we stood for a just cause and then were made to bite the dust? There never was a juster cause championed by any profession than this we have set out to do. We cannot, we must not, be drawn from our position. Our resolution is and will ever be, until a bill is passed embodying the essentials needed, firm and steadfast to fight along this line if it takes every year of the present Congress, or more.

I propose, therefore, in this article, to cover the following points: 1. Some things the profession has done in the way of assisting in making army veterinary service legislation an issue; 2. Where our failure so far has lain and how it can be corrected;

3. The bill now before Congress; 4. Chances for the passage of the present bill; 5. Conclusions.

I. Some Things the Profession Has Done in the Way of Assisting in Making Army Veterinary Service Legislation an Issue.

Few men have a comprehension of the volume of legislative business done by Congress in a single session. Few men can. The veterinarian, engrossed with the cares of his own professional business, living intensely, strenuously, within his own circle, does not with any frequency have time to consider the big world outside him; nor does he hardly have a very thorough acquaintance with national issues in national politics. But professional men are readers and thinkers. They have keenness to grasp the main features of live questions in politics, and they frequently discuss them at times with more than ordinary intelligence. The subjects come to their attention in the club, the newspaper, the magazine. Though they may have more than ordinary intelligence on such subjects being nationally talked about, which may result in national legislation, neither they nor any other professional men can be expected to have a large apprehension of the volume of legislative business transacted in Washington during a session; nor can everybody else, except members of Congress of long standing, special students of statecraft, or government officials who follow the course of legislation in each session. But national political topics, which engage so much of the public attention and find so much space in the newspapers, and which may result in new legislation, comprise but a small part of the volume of business of Congress. The *Congressional Record*, which is published daily while Congress is in session, is a sort of magazine containing minutely recorded information of the doings of Congress. It is accessible to every citizen, as any man may have it sent to him by application to his Congressman, and it is on file in every good public library. Yet few men, except politicians and those interested in a particular bill, look at it. The number for January 6, 1913, when the army veterinary bill passed the House unanimously, contains no less than eighteen closely printed columns of discussion and debate on the floor of the House before the bill came to a vote. Nevertheless that was only a very small part of the printed matter in the *Congressional Record* of that day. This official record, covering the work of Congress for a whole session, contains thousands of double-column pages. I mention all this to disclose to the

reader one aspect of the immense difficulty of carrying through successfully such a piece of work as army veterinary service legislation.

When one looks at the matter from another point of view, that of the intricacies of legislative methods and machinery, the wonder is that, even with our strenuosity and persistency, our pluck and pugnacity, we have been able to make such excellent headway as we have. A man must have more conceit than I who has the temerity to say that he has a complete acquaintance with the manœuvring which finally gets a bill, large or small, through Congress. Every bill has a rough and rugged road to travel, full of pitfalls and may be legislative murderers, in the shape of "opponents," who would take its life. A bill goes through several committee furnaces. It is slashed and reshaped. It is pummelled or shot at by legislative artillery. It is examined piecemeal. It has new words, phrases or clauses incorporated into its substance or withdrawn from it. No bill gets through in the form that it was introduced. It is sure to be abridged. If it contains the essentials of that originally introduced, no more can be expected. All legislation is necessarily compromise. The eyes upon it are many. Modification and remoulding are to be expected. If, however, we can bring before the congressional body a bill which contains the essentials of what our profession needs in the army and if we can show that body and all concerned that it is for the best interests of the public service, we should be able to pass it, though it has, as all bills do, to run the gauntlet of legislative machinery and the friendly or unfriendly scrutiny of every member of Congress.

There is a heavy pressure from all sides and crowding forward of larger issues, such as the tariff and currency reform in the present extra ("extraordinary") session of Congress, which are engrossing to the legislative body and which command a large share of their time and attention, though these issues comprise only a small part of the immense volume of legislative business. There is at all times the machinery, or course which bills must go through, to be taken into account. The marvelous thing is not that big bills pass; but that so many minor bills are so carefully and often wisely considered by the national body, and that in due course of time they become national statutes. Such a one is the Army Veterinary Service Bill. Minor bills, I think, are apt to take longer time to pass than bills of national importance, like the present tariff bill urged by President Wilson. They less engage public attention, and a little time must be taken to

acquaint the members of Congress with their meaning and purpose.

This is one of the reasons why our movement for army veterinary service legislation has not so far won. The profession has, however, been able, with greater force and more intelligent propagandism, to engage the attention of Congress to this subject from the days of the noble Huidekoper to the day of the gallant and resourceful Hoskins. Here is where the profession, in lending its assistance, has made possible the spread of a knowledge of the necessity for such legislation. Above all things we have carried on a campaign of publicity. It is advertisement on a most comprehensive scale and of the highest kind, because it is an appeal for betterment all along the line. Its endeavor is to call out the highest and best there is in the manhood of the profession in a grand missionary effort to reform the army veterinary service and make it, as it should be, co-equal with others in the army. An appeal to manliness and to the sense of fair play touches a vital spot. The aim has been to promote within our ranks such a feeling of the injustice done the army veterinarian, and the humiliation he is forced to suffer, as will unite our tens of thousands of graduates and their hosts of friends in all walks of life and in all strata of society in a noble effort to improve the status of our brothers in the army. No man in the army can blame us for that effort. No man "high though his title, proud his name, boundless his wealth as wish may claim," can find fault with any other man who, inspired by proper motives, exercises his talents for the betterment of himself and his calling.

Under the leadership of Dr. Huidekoper we were almost successful in ushering in the reform, and if the reform had been successful, by this time we would have had a small corps of veterinarians in the army, doughty spokesmen for higher scholarship and better practical work. From his time up to just before Dr. Hoskins took hold of the leadership for reform of the army veterinary service, little was accomplished, except to establish the right of retirement in addition to regular existing law. But under Dr. Hoskins' leadership, begun two years ago, a stronger pulsation was given the effort for reform and a militant leadership was in evidence which brought out all the battling power and enthusiastic following which recognized ability in generalship always inspires. The effort has not yet been fruitful in the passage of a law. Notwithstanding the fact that the final outcome is not yet, the profession has experienced such an awakening that the flame will never die out. We have become

locked and united, and a widespread knowledge has been given our confreres which will bring this reform to its felicitous consummation.

II. Where Our Failure so Far Has Lain and How It Can Be Corrected.

Before the 1912-1913 campaign for the passage of the Army Veterinary Service Bill in the 62d Congress began, there had been many attempts to cause the enaction of corrective legislation, dating from the Spanish War days. That most remarkable man, Dr. Huidekoper, a leader of the collected profession, attempted to establish a veterinary corps in the army with a colonel at its head. He put his magnificent talents and large fortune into the work and was on the verge of complete success when reconsideration of the bill was asked by the War Department, and, as passed, it was stripped of any semblance of a corps. Failure was manifest, looking at the matter from the antipodes of thought. We failed because we asked too much to be given us at once. The War Department failed to take advantage of an excellent opportunity to inaugurate veterinary work in the army on the best basis, while Congress was in the mood to grant it. If the War Department had taken a fair view of the case and had then permitted veterinarians to be commissioned in the lower grades, it would have made way for improvement in the veterinary service of the army in keeping with the advances being made in every other line of veterinary endeavor in America. Huidekoper's effort was to take advantage of the *exposé* of defects in the U. S. army veterinary service made known by Spanish War experiences and to push through a law to reform the condition. There are those who seem to think that it will need yet another destructive, almost paralyzing war to teach the War Department the sore need of reform. When there is then a great consumption of animal food products by the soldiers and when horses and mules are used in large numbers for transportation, the need for the best veterinary advice and the giving of authority to him become apparent. If in the course of time war should commence with Mexico, that, it is thought, will be the veterinary opportunity. If the veterinarian then has no commissioned authority, the effects would be serious.

The failure of the profession to get official recognition for the army veterinarian from the days of Huidekoper until the days of the leadership of Hoskins has largely been due to working in too narrow a circle and from lack of organization for a supreme effort. Dependence, in some instances, has been placed

in scattered, isolated friends in the War Department, some of high rank, who sentimentally, rather than ardently, felt that reform would be a good thing. These of themselves could never carry such a reform through Congress. Dependence again has been placed in the naming of a suitable legislative committee of the A. V. M. A. and expecting it, without funds even for correspondence, to have a bill introduced and passed if it could. Dependence has been placed in the War Department to make a veterinary bill a departmental desire or policy, or part of its military legislation as one of the "service bills in Congress." Such a roseate hope soon was dashed to the ground amidst falling tears.

Great and lasting reforms are carried out in none of these ways. When a reform of the kind of which we are speaking is to be sought for, the keynote is self-assertion. It is our burden, a profession's burden, and we must shoulder it ourselves. It may weigh heavy upon us, like a cross, but, though we may sweat blood, we must carry it. Neither the individual merit, nor the collective merit of so small a body as the army veterinarians themselves, even though they were all Merillats, Williamses, Laws or Liautards, could correct this evil. Ability amongst army veterinarians is at present permitted by sufferance. The evil which needs correcting is chronic and constitutional and belongs to the profession rather than to a few of its members who happen to wear regimentals by order of the Secretary of War. The evil can be corrected only by united, open-hearted, whole-souled professional effort. The combination of a whole profession and its friends is the combination which will strike terror into the hearts of the enemies of this reform. Toleration of the evil must not be countenanced any longer. Its end is in sight.

III. The Bill Now Before Congress.

With the precision of men in dead earnest, no sooner had our bill failed of passage than another was introduced into the House by Representative Hay of Virginia. Mr. Hay, the chairman of the House Committee on Military Affairs, whose action for the bill in the last session of Congress has been many times applauded, has again championed the cause. This bill is known as H. R. 4541.

IV. The Chances for the Passage of the Present Bill.

The chances for the passage of the present bill are of the best. The bill introduced contains the essentials needed. As the

army veterinarians are the ones immediately concerned in this bill, the question to ask first is: How do they stand on the measure? The answer is that they are harmonious, unified, hopeful. When the bill was launched, which ran such an excellent course in the 62d Congress, it was found that they were a unit for the bill. The new bill is the old bill with little change.

Consider, also, the bill itself and whose hands it is in. In the last Congress Mr. Hay, the chairman of the House Committee on Military Affairs, was our champion; and this time he has gone a step further, he has reintroduced the bill himself, thus making it a special part of the work of his committee during the present Congress. Even the army service papers would grant that that omens much. In the words of Dr. Hoskins, "things are more open now" in the Senate. The Government from top to toe is Democratic. The bill which has been introduced has all the hall marks of progressiveness. That feeling of exclusiveness, that "I am holier than thou," can find no place in the forces that now dominate Congress. The bill is launched under favorable circumstances. It passed the Democratic House when fathered by Mr. Hay. It ought to pass another Democratic house when he fathers it and is for it the spokesman, and without any parley it should, for the same reason, find its way through the Senate.

V. Conclusions.

We are living in a new era. The party in power represents a return to the first principles of the fathers who founded our Government. It was Thomas Jefferson who wrote the Declaration of Independence, a document which has had no equal as an expression in its simplicity of the rights of man under a free government. Our contention is that our belief in the equal dignity of all serious studies; the equal dignity of all services, professions, is in harmony with the spirit of democracy. Democratic principles forbid the granting of special privileges to one class of people that cannot be said with equal reason to belong to others as well. Those who have had their feet in the government saddle up to this time denied justice to the veterinarian in the army that has been granted to the physician and the dentist, and have ridden him down hard. Times change. Wrong notions die. The sun of righteousness breaks through on the new day, when an error, long causing us to suffer, disappears. Is that day here? We believe it is.

GARRISON STEELE, M.D., D.V.M.

BIBLIOGRAPHY.

BOVINE TUBERCULOSIS AND ITS CONTROL.

BOVINE TUBERCULOSIS AND ITS CONTROL, by Veranns Alva Moore, B.S., M.D., V.M.D., Professor of Comparative Pathology, Bacteriology and Meat Inspection, New York State Veterinary College at Cornell University, and Director of the College; 164 pages, with 30 full page illustrations. Ithaca, N. Y., Carpenter and Company. 1913. $2.00 net, postpaid.

Fittingly adorned by a striking picture of Dr. Robert Koch, discoverer of the *cause* of tuberculosis, as a frontispiece, this work summarizes the whole present-day knowledge of bovine tuberculosis and methods of controlling this scourge, which not only endangers human health and human lives, but also causes incalculable financial losses to those engaged in one of the greatest and most essential industries of our country, the live-stock industry. The work includes a compilation of reports of individuals, commissions, government laboratory workers and state experiment stations, no less than 76 references being made use of in its preparation. The book is appropriately begun by a history of tuberculosis in cattle; followed by the distribution, economic and sanitary importance of bovine tuberculosis. Then the cause of tuberculosis in cattle; the nature of tuberculosis and the changes produced in the tissues by tubercle bacteria; symptoms of tuberculosis in cattle; methods of dissemination; the diagnosis of tuberculosis in cattle; tuberculin and its use; physical examination in detecting tuberculosis in cattle; immunization of cattle against tuberculosis; the control of bovine tuberculosis; and finally the report of the International Commission on the Control of Bovine Tuberculosis, as published in the AMERICAN VETERINARY REVIEW, October, 1910. The work also contains 30 full-page illustrations, the plates appearing on heavy smooth-finished paper. *Bovine Tuberculosis and Its Control*, which has gathered together in one small volume practically the present-day knowledge on the subject, represents an immense amount of labor in its preparation, and impresses the reader with the very broad knowledge of the subject on the part of its author, who was actuated by a desire to give to practitioners of veterinary medi-

cine and health officers a summary of the knowledge of bovine tuberculosis and its control, gleaned from every source of knowledge on the subject at his command (not alone the published observations of others, which he has faithfully reviewed, but also his own careful, honest observations, both in the field and in the laboratory), in as concise a form as possible; and we believe that he has been eminently successful in his undertaking, and through it has contributed a valuable addition to the veterinary literature of the day. The veterinary profession owes much to Prof. Moore for this compendium of the vast subject that he has treated at once in such a brief, yet comprehensive manner; to the New York State Veterinary College, from whose collection of original specimens the photographs were taken, from which the illustrations were made; and to the publishers for the excellent manner in which they have executed their work in placing *Bovine Tuberculosis and Its Control* at its command.

What *The Cornell Veterinarian* Says of It.

This is an attractive volume written for the purpose of bringing to the veterinarians a summary of the present knowledge of bovine tuberculosis. The plates are most excellent, illustrating the tubercle bacterium, tuberculin reactions and various forms of lesions.

The book contains eleven chapters. They treat in a concise and direct manner: The History of Bovine Tuberculosis; Its Distribution, Economic and Sanitary Importance; Its Cause; Its Tissue Changes; Symptoms, Methods of Dissemination; Diagnosis; Tuberculin and Its Use; Physical Examination and Its Value in Detecting Tuberculosis in Cattle; Immunization of Cattle against Tuberculosis; and Methods for Its Control. There is an appendix containing the report of the International Commission on the Control of Bovine Tuberculosis. There are numerous references to the literature.

While the volume is not large, it deals with the various phases of this destructive disease in an interesting and instructive manner. The chapters on the dissemination of the disease, tuberculin and its use, and the methods for its control are especially helpful. As this book is the outgrowth of a long study of tuberculosis on the part of the author, it is exceptionally free from controversial matter. It deals with the facts as they are understood to-day relative to the nature of the disease, thereby pointing

the way to its eradication. This is to be accomplished through the intelligent co-operation of the owners of cattle with the wise advice of their veterinarians. It is believed that this volume will be of much assistance not only to the practitioners, for whom it was especially written, but to breeders and others interested in the subject.

THE ANIMAL DOCTOR.

THE ANIMAL DOCTOR, by Harold Leeney, M.R.C.V.S.; 489 pages, with 58 illustrations. New York, William R. Jenkins Co., 1913.

This suggestive title adorns a neatly bound book in rich maroon and gold, of convenient size for easy handling, which contains a brief, yet clear description of the diseases of the domestic animals. Some of the important subjects are gone into with more detail than others, which the author regards as less important. For example, he appreciates fully not only the importance of lameness in the horse, but, also, the difficulty of diagnosis in many instances, and treats the subject pretty fully. The book gives considerable space to a dose table for horses, sheep, pigs and dogs; followed by a large collection of formulas for horses, cattle, sheep, pigs and dogs. Altogether, *The Animal Doctor* is a handy little book for a busy practitioner, but should be kept out of the hands of laymen, who may be tempted by the presence of the formulas designated for various purposes, *Alterative Balls, Pain Killers, Condition Balls, Newmarket Trainer's Condition Balls, Cough Balls, Monday Morning Leg*, or *Oedema Balls, Fever Balls*, etc., etc., to treat their own animals, and by improper diagnosis do harm and get the animal in a condition in which it is difficult for a veterinarian to treat.

THE NORTH DAKOTA VETERINARY MEDICAL ASSOCIATION will hold its summer meeting at Fargo, July 1, 2, and 3.

HAS TWENTY-FIVE VOLUMES OF REVIEW BOUND AND FINDS THEM USEFUL REFERENCE WORKS.—In a recent communication Dr. De Vine writes: "I now have some twenty-five volumes of the REVIEW bound and in my office, and they not only make a very nice appearing library, but I so frequently find them very useful references. I extend to you my sincere and warm wishes for your continued success as it is possible for any subscriber to wish you."

SOCIETY MEETINGS.

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular monthly meeting of this association was called to order by President McKinney in the lecture room of the New York American Veterinary College, at 8.45 p. m.

The minutes of the April meeting were read and approved.

The prosecuting committee reported progress.

The special committee appointed to consider Assembly Bills 2187 and 2188 reported that it was not expedient for this association to take action in this matter.

On motion, regularly made, seconded and carried, the committee was discharged with thanks.

Dr. Gill moved that the by-laws be suspended, and the visiting veterinarians be extended the privilege of the floor, seconded and unanimously carried.

Dr. D. W. Cochran, of New York City, then read a very interesting paper entitled "The Principles of Horseshoeing." This paper dealt with this subject in an exhaustive and comprehensive manner, and was indicative of a great amount of study and practical experience.

Dr. T. B. Rogers in opening the discussion asked the question, "What is considered the necessary amount of instruction veterinary students should receive in the art of horseshoeing?"

Dr. Gill said that it should be taught and practiced within the walls of the veterinary schools to such an extent as to give the student a practical knowledge of this important subject.

It was the consensus of opinion that the average veterinary school does not give enough attention to this important branch.

Dr. Rogers stated that he had asked the above question, prompted by his own lack of knowledge in this line of work, which he had at times found embarrassing, especially in rural districts, when the services of a practical horseshoer were hard to obtain.

A general discussion of practical and pathological horseshoeing then followed, in which a number of the members and visitors took part.

Dr. John L. Leonard then read an interesting paper on "Glanders in Porto Rico." In this article the doctor gave a vivid account of his work in combating this scourge in this island of the tropics. Also stated that glanders was often confounded with ulcerative lymphangitis, which was also very prevalent on the island. This was successfully treated by the use of bacterins. It was not uncommon to find an animal affected with both glanders and this form of lymphangitis. Mallein was used as a diagnostic agent.

The secretary read a letter from the commissioner of health regarding the resolution adopted by this association.

A unanimous vote of thanks was tendered Drs. Cochran and Leonard for their contributions to the program of the evening.

Dr. Ellis in a few well-chosen words then spoke of the death of Dr. Geo. H. Berns' wife, and also of the son of Dr. E. B. Ackerman.

It was regularly moved, seconded and carried that a committee be appointed to draft suitable resolutions, and a copy of the same forwarded to Dr. Berns and Dr. Ackerman.

The president appointed Drs. Ellis, Clayton and Gill.

Dr. Gill, chairman of the alumni dinner committee, announced that the annual meeting and banquet would be held at the New York Athletic Club, Thursday evening, May 8, 1913, at 7.30 p. m.

The College Bill was announced as now being before the Governor, awaiting his signature to make it law.

An interesting program was promised for the June meeting.

No further business appearing, the meeting adjourned.

R. S. MacKellar, Secretary.

MAINE VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of the above association was held in Portland at the West End Hotel April 9, 1913.

In the afternoon a visit to the Pond Cove Farm was made by many of the members of the association through an invitation extended the association by the proprietor, Mr. Henry G. Beyer, Jr.

Meeting called to order by President, Dr. H. B. F. Jervis, at 7.45 o'clock, when the following answered to the roll call: Drs. C. L. Blakely, W. H. Corey, J. B. Darling, C. F. Dwinal, H. N. Eames, W. E. Fairbanks, C. E. French, J. H. Goddard, G. R. Inglis, W. R. Jackson, H. B. F. Jervis, A. Joly, M. E. Maddocks, W. L. Mebane, C. W. McGillicuddy, A. L. Murch, J. A. Ness, C. H. Newton, J. L. Parks, H. T. Potter, B. L. Pratt, C. W. Purcell, W. H. Robinson, F. L. Russell, E. E. Russell, C. L. Ryan, I. L. Salley, W. H. Spear, H. L. Stevens, H. S. Usher, C. W. Watson, G. F. Wescott, H. B. Wescott and W. L. West.

Visitors: Drs. E. E. Gibbs, J. T. Lettering, G. E. Chesley and A. W. Peabody.

Invited Guests. Invited guests of the association were: Dr. Herbert F. Palmer, Mr. F. N. Fish and Mr. S. W. Humphreys, representatives of the H. K. Mulford Co. of Philadelphia. Mr. H. F. Smith was also a guest.

The meeting was turned over to Dr. A. Joly, the new State Sanitary Live-Stock Commissioner, who announced the appointment of 45 graduated veterinarians of the state to act as his deputies and also outlined the policies of his office.

At 9.45 Dr. Jervis introduced Dr. Herbert F. Palmer, of Philadelphia, as the speaker of the evening. Dr. Palmer gave a very interesting illustrated lecture on the "Preparation and Use of Serums, Vaccines and Bacterins." He also presented some 30 views of the recent horse plague in Kansas and described the conditions as he saw them while in the field. Dr. Palmer was given very earnest attention by all those present. The members of the association gave him a rising vote of thanks for his very interesting and instructive lecture.

New Members: Those admitted to membership were Drs. E. E. Gibbs, G. E. Chesley, J. L. Parks, E. P. Henderson, A. N. Peabody, J. T. Lettering and L. K. Green.

At 10.45 Dr. Jervis turned the chair over to Dr. Purcell, the Vice-President, as he had to depart early. The executive committee reported favorably on the books of the secretary and treasurer.

Papers: Dr. Purcell read a very interesting paper on "Some Phases of the Tuberculin Test," which was discussed freely.

It was voted to hold the July meeting at Belfast on the 9th of July.

H. B. Wescott, Secretary.

NEWS AND ITEMS.

THE SCHUYLKILL VALLEY VETERINARY MEDICAL ASSOCIATION will meet at Reading, Pa., June 18. A full attendance is anticipated.

THE CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION will hold its next meeting in Los Angeles on June 11, and it is expected that a large attendance of the veterinarians of the state will congregate in the City of Angels at that time.

FARMERS' SUMMER SCHOOL AT AUBURN, ALA., August 1 to 9, will be the beginning of the eleventh year of this work, in which farmers, farmers' wives, boys and girls are given profitable, intellectual and practical work. Men, women, boys and girls are invited from every county, town, hamlet and farm in Alabama. Ten to twelve demonstrations and lectures every day. This excellent work is all carried on under the direction of our good friend, Dr. C. A. Cary.

THE MISSOURI VALLEY VETERINARY MEDICAL ASSOCIATION. —Extensive preparations are being made for the annual summer meeting of the Missouri Valley Veterinary Medical Association at Omaha, June 30 and July 1 and 2. An effort is being made with very encouraging progress to secure an attractive clinic, the one of last summer having been so thoroughly enjoyed by those who attended. Dr. Hal Simpson, secretary of the association, wishes it known that all veterinarians in the United States are cordially invited to attend its meeting and take part in its activities.

WHAT'S THE USE?

WHY NOT LET THE COUNTRY DOCTOR DO IT?

Cure for Colic.

"To Wallaces' Farmer:

"I noticed recently an inquiry for a cure for colic in horses, and your advice to administer turpentine and linseed oil as a remedy.

"While the remedy is good in some cases, it is not an infallible one, and I offer you a remedy that is positive in all cases.

Surely you are looking for just such a remedy. I have been engaged in the practice of medicine (regular) for forty-five years. When I commenced practice, an old practitioner said to me once in reply to a question as to the cure of a child bed fever (of which disease I expressed great fear): 'It's easy. Opium in sufficient doses is a positive cure, not only for that, but for all forms of colic, cholera, cholera morbus, etc.' I had great confidence in this old doctor, and he was a highly educated man. I followed his advice and have never known the remedy to fail. I have cured many horses and cows after the veterinarians failed; and when the veterinarian gives laudanum or other preparation of opium, he too frequently gives only quarter or half doses. Give enough to quiet the animal or man, and the remedy is positive.

"Too often both in man and beast the conclusion is jumped at that the bowels need moving. More generally this is not the case, and if it is, the remedy cures all the same. You ask, how? It simply relaxes spasm and relieves irritation and pain.

"The last case I had in the beast department was in a mare, at the livery stable where I hire horses. She had been sick two days, and a veterinarian was at work on her. As I entered the stable, the mare was lying flat on the floor and was badly swollen. I said, 'Ben, isn't that mare well yet?' 'No,' said he. 'Have you given her any laudanum?' 'Yes, Jack has been giving it to her.' 'Got any more here?' 'Yes, there is four ounces I just got.' 'Pour it all down right now,' I said. 'All?' 'Yes, all.' He did so, and in an hour the mare was standing quietly and nodding, cured, of course.

"The first dose in a horse should not be less than four ounces of laudanum, and repeat every hour with two ounces until perfectly easy.

"Illinois. H. J. PARKER, M.D."

PROVISIONS OF THE LAW, BY-LAWS AND REGULATIONS OF THE STATE BOARD OF EXAMINERS IN VETERINARY MEDICINE AND SURGERY IN THE STATE OF MONTANA.

All persons desiring to practice veterinary medicine and surgery in the State of Montana who resided in the state on March 13, 1913, must be possessed of a diploma from a recognized veterinary medical school. All such persons shall present their diploma, together with regular application form furnished by the Secretary of the Board of Veterinary Medical Examiners, the statutory fee of ten dollars ($10) and the registration fee of

two dollars ($2), and they shall be entitled to a license without examination.

All other persons must have a diploma from a veterinary college which is recognized by the American Veterinary Medical Association, and said diploma shall be submitted to the Board for inspection and verification, and the candidate shall be required to pass an examination before the Board in the following subjects: Comparative Anatomy; Chemistry; Physiology and Hygiene; Surgery and Obstetrics; Pathology, including Bacteriology, Parasitology; Theory and Practice of Veterinary Medicine, including Materia Medica and Therapeutics.

(A general average of seventy-five (75) per cent. is required to pass. Five (5) per cent. is allowed for each five years an applicant has practiced. Any candidate failing in one subject, with a general average of eighty (80) per cent. in the others, may be examined in that subject at any regular examination. Failing in one subject, with a lower average in two or more subjects, may be admitted to subsequent examination on original fee after six months have elapsed, and must then take the examination in all subjects. The Board may issue temporary license to such candidate.

The first examination shall be held in the Senate Chamber, State Capitol Building, Helena, Montana, on the first Monday in July, 1913; and, thereafter, examinations are held on the third Monday in May and November of each year, said examinations to begin at ten o'clock a. m.

A temporary license may be issued by the Board upon filing with the Secretary-Treasurer the license fee of ten dollars ($10), together with a properly filled application form, diploma and registration fee of one dollar ($1), which will entitle the applicant to legally practice veterinary medicine and surgery in the State of Montana until the next succeeding examination.

In case the applicant successfully passes the required examination, the ten-dollar ($10) fee will be retained, the temporary license revoked and a permanent license granted upon receipt of the regular registration fee, which shall not exceed two dollars ($2).

Applications will be received up to the time of beginning of examinations. An unmounted cabinet size photograph of each applicant is also required.

A. D. KNOWLES, Secretary-Treasurer.

Livingston, Montana, May 12, 1913.

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary.
Alabama Veterinary Med. Ass'n	June 6-7, 1913	Birmingham	C. A. Cary, Auburn.
Alumni Ass'n, N. Y.-A. V. C.	April, 1914	141 W. 54th St.	P. K. Nichols, Port Richmond, N.Y.
American V. M. Ass'n.	Sept. 1-2-3-4-5, 1913.	New York, N. Y.	C. J. Marshall, Philadelphia.
Arkansas Veterinary Ass'n.	January, 1914	Ft. Smith	J. B. Arthur, Russellville.
Ass'n Médécale Veterinare Française. "Laval"	1st and 3d Thur. of each month	Lec. Room, Laval Un'y, Mon.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago	2d Fri. each month.	Chicago	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha.	3d Mon. each month.	S. Omaha, Neb.	E. J. Jackson, So. Omaha.
Buchanan Co. Vet. Ass'n	Monthly	St. Joseph and vicinity	F. W. Caldwell, St. Joseph, Mo.
California State V. M. Ass'n.	June 11, 1913	Los Angeles	John F. McKenna, Fresno.
Central Canada V. Ass'n.	Feb. and July	Ottawa	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n.	June and Nov.	Syracuse	W. B. Switzer, Oswego.
Chicago Veterinary Society	2d Tues. each month.	Chicago	D. M. Campbell, Chicago.
Colorado State V. M. Ass'n.	May 28-29, 1913.	Ft. Collins	I. E. Newsom, Ft. Collins.
Connecticut V. M. Ass'n.	August 6, 1913	Waterbury	B. K. Dow, Willimantic.
Delaware State Vet. Society	Jan., Apl., July, Oct.	Wilmington	A. S. Houchin, Newark, Del.
Essex Co. (N. J.) V. M. A.	3d Mon. each month.	Newark, N. J.	J. F. Carey, East Ornage, N. J.
Genesee Valley V. M. Ass'n.	2d week, July, 1913.	Rochester	J. H. Taylor, Henrietta.
Georgia State V. M. A.	Dec. 22-23, 1913	Atlanta	P. F. Bahnsen, Americus.
V. M. A. of Geo. Wash. Un'y	2d Sat. each month.	Wash., D. C.	A. T. Ayers.
Hamilton Co. (Ohio) V. A.			Louis P. Cook, Cincinnati.
Illinois State V. M. Ass'n.	July 10, 1913	Springfield	L. A. Merillat, Chicago.
Indiana Veterinary Association	Jan. 14, 1914	Indianapolis	A. F. Nelson, Indianapolis.
Iowa Veterinary Ass'n.	Pending	Pending	C. H. Stange, Ames.
Kansas State V. M. Ass'n.	Pending	Pending	J. H. Burt, Manhattan.
Kentucky V. M. Ass'n.	Oct. & Feb. each year.	Lexington	Robert Graham, Lexington.
Keystone V. M. Ass'n.	2d Tues. each month.	Philadelphia	Cheston M. Hoskins.
Lake Erie V. M. Association	Pending	Pending	Phil. H. Fulstow, Norwalk, Ohio.
Louisiana State V. M. Ass'n.	Sept., 1913	Lake Charles	Hamlet Moore, New Orleans, La.
Maine Vet. Med. Ass'n.	July 9, 1913	Belfast	H. B. Wescott, Portland.
Maryland State Vet. Society		Baltimore	H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n.	4th Wed. each month.	Young's, Boston.	J. H. Seale, Salem.
Michigan State V. M. Ass'n.	Feb. 3, 4, 1914	Lansing	W. A. Ewalt, Mt. Clemens.
Minnesota State V. M. Ass'n.	July 9, 10, 1913	Albert Lea	G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n.	Aug. 29, 1913	Starkville	Wm. P. Ferguson, Grenada.
Missouri Valley V. Ass'n.	June 30, July 1-2, '13.	Omaha	Hal. C. Simpson, Denison, Ia.
Missouri Vet. Med. Ass'n.	July, 1913	Kirksville	S. Stewart, Kansas City.
Montana State V. M. A.	Sept. 24, 25, 1913	Helena	A. D. Knowles, Livingston.
Nebraska V. M. Ass'n.	1st Mo. & Tu., Dec. '13	Lincoln, Neb	Carl J. Norden, Nebraska City.
New York S. V. M. Soc'y.	1st week Sept., 1913.	New York	H. J. Milks, Ithaca, N. Y.
North Carolina V. M. Ass'n.	June, 1913	Salisbury	M. J. Ragland, Salisbury.
North Dakota V. M. Ass'n.	July 1, 2, 3, 1913	Fargo	C. H. Babcock, New Rockford.
North-Western Ohio V. M. A.	Feb. and Nov.	Lima	A. J. Kline, Wauseon.
Ohio State V. M. Ass'n.	Jan. 14, 15, 1914	Columbus	Reuben Hilty, Toledo.
Ohio Soc. of Comparative Med.	Annually	Upper Sandusky.	F. F. Sheets, Van Wert, Ohio.
Ohio Valley Vet. Med. Ass'n.			J. C. Howard, Sullivan.
Oklahoma V. M. Ass'n.	Fall, 1913	Oklahoma City.	C. E. Steel, Oklahoma City.
Ontario Vet. Ass'n.	1st Week in Feb. 1914	Toronto	L. A. Willson, Toronto.
Pennsylvania State V. M. A.	Sept. 16, 1913	Not selected.	John Reichel, Glenolden.
Philippine V. M. A.	Call of President.	Manila	David C. Kretzer, Manila.
Portland Vet. Med. Ass'n.	4th Tues. each month.	Portland, Ore. Mon. and Que.	Sam. B. Foster, Portland, Ore. Gustave Boyer, Rigaud, P. Q.
Province of Quebec V. M. A.			
Rhode Island V. M. Ass'n.	Jan. and June	Providence	J. S. Pollard, Providence.
South Carolina Ass'n of Veter'ns.	Pending	Pending	B. K. McInnes, Charleston.
South Illinois V. M. and Surg. Ass'n.	Aug. 5-6-7 1913	Fillmore	F. Hockman, Iola.
St. Louis Soc. of Vet. Inspectors	1st Wed. fol. the 2d Sun. each month.	St. Louis	Wm. T. Conway, St. Louis, Mo.
Schuylkill Valley V. M. A.	June 18, 1913	Reading	W. G. Huyett, Wernersville.
Soc. Vet. Alumni Univ. Penn.		Philadelphia	B. T. Woodward, Wash'n, D. C.
South Dakota V. M. A.	July 8, 9, 1913	Mitchell	S. W. Allen, Watertown.
Southern Auxiliary of California State V. M. Ass'n.	Jan., Apl., July, Oct.	Los Angeles	J. A. Dell, Los Angeles.
South St. Joseph Ass'n of Vet. Insp.	4th Tues. each month	407 Illinois Ave.	H. R. Collins, South St. Joseph.
Tennessee Vet. Med. Ass'n.	November, 1913	Memphis	O. L. McMahon, Columbia.
Texas V. M. Ass'n.	Nov., 1913	College Station.	Allen J. Foster, Marshalltown.
Twin City V. M. Ass'n.	2d Thu. each month.	St. P.-Minneap.	S. H. Ward, St. Paul, Minn.
Utah Vet. Med. Ass'n.	Pending	Pending	A. J. Webb, Layton.
Vermont Vet. Med. Ass'n.			G. T. Stevenson, Burlington.
Veterinary Ass'n of Alberta			C. H. H. Sweetapple, For. Saskatchewan, Alta., Can.
Vet. Ass'n Dist. of Columbia	3d Wed. each month.	514 9th St., N.W.	M. Page Smith, Washington, D. C.
Vet. Ass'n of Manitoba.	Feb. & July each yr.	Winnipeg	Wm. Hilton, Winnipeg.
Vet. Med. Ass'n of N. J.	July 10, 1913	Jersey City	E. L. Loblein, New Brunswick.
V. M. Ass'n, New York City	1st Wed. each month.	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Veterinary Practitioners' Club.	Monthly	Jersey City	A. F. Mount, Jersey City.
Virginia State V. M. Ass'n.	July 10, 1913	Old Point Comf't	Geo. C. Faville, North Emporia.
Washington State Col. V. M. A.	1st & 3d Fri. Eve.	Pullman	R. J. Donohue, Pullman.
Washington State V. M. A.	June 19, 20, 1913	Wenatchee	Carl Cozier, Bellingham.
Western Penn. V. M. Ass'n.	3d Thu. each month.	Pittsburgh	Benjamin Gunner, Sewickley.
Wisconsin Soc. Vet. Grad.	Pending	Pending	J. W. Beckwith, Shallsburg.
York Co. (Pa.) V. M. A.	June. Sept. Dec. Mar.	York	E. S. Bausticker, York, Pa.

PUBLISHERS' DEPARTMENT.

Subscription price, $3 per annum, invariably in advance; Canadian subscriptions, $3.25; foreign countries, $3.60; students while attending college, $2; Students in Canada, $2.25; single copies, 30 cents in U. S. **Copy for advertisements should be received by 10th of month.**

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address. **Make all checks or P. O. orders payable to American Veterinary Review.**

MARK THE PAGE when you find something interesting whether in the text of the Journal or amongst its advertising pages. THE NORWICH PHARMACAL Co., whose advertisement appears on the upper half of page 21, have a complete line of both drugs and pharmaceuticals, and the quality is of the first grade. Write them, mentioning the REVIEW.

GASTRIC FLATULENCE LOSES ITS TERRORS when a man knows he has the power to relieve it instantly by passing a stomach tube and allowing the gas to escape. Dr. J. M. Phillips "perfected" stomach tube, advertised on page 27, is undoubtedly the best one on the market. Perfected by a practising veterinarian for veterinarians. His soft rubber catheter is ideal, lasts forever, is easily carried and readily passed without the aid of stilette. The doctor has other things also. Write him, mentioning the REVIEW.

BACILLOL HAS A WIDE RANGE OF USEFULNESS in veterinary practice, being used as a general antiseptic and germicide in wound dressing and surgical procedures, also the *Bacillol Cartridges* in dysentery in calves. This malady in calves is prevented by introducing the cartridges into the genital canals of the brood animals shortly before calving. Write Bruno Grosche & Co., 4 and 6 Jones lane, New York, N. Y., whose advertisement appears on page 28; for particulars, mention the REVIEW when you write.